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JANUARY 1947

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Pacific Marine Review

Back to Ships!

By T. Douglas MacMullen

Thousands of Pacific Marine Review readers are actual shippers of freight. They include shipbuilders, wholesalers, retailers, and manufacturers of ship supplies and equipment; exporters and importers in large numbers; and the ship operators, themselves. To you, who are included in the above group, this message is addressed. We urge that you get back to shipping by water.

Your business success is definitely linked to the shipping industry on the Pacific Coast. You are a part of it. Without you, there could be no shipping industry. Conversely, without shipping, there would be a serious void in *your* business. The interests of all of us have a certain unity. In fact, this unity of interest extends to all types of business on the Pacific Coast, especially in the port cities.

During the war, the intercoastal and coastwise movement of freight was exclusively by rail or truck. The shipping lines, yours and mine, were at war. They deserve at least as much from their country as their competitors. They deserve at least the opportunity to recover. They deserve it from the government departments, from civic and traffic groups, *and from shippers.*

There is more involved in water shipping than a few cents in the freight rates. The entire existence of certain industries depends on water service. Fruits, for instance, from California, Oregon and Washington, could scarcely compete in the eastern market if they were shipped at rail rates. Not the presently depressed rail rates, which the railroads maintain to keep the ships out, but the full scale non-exception tariffs. These are the rates that are now applied to rail shipments to points that do not have water service.

You need your ships; your city needs your ships; your back country needs your ships; the West needs your ships. Use them! Keep them sailing! Encourage the development of the merchant marine against your own and your country's future emergencies!

The Planners Behind the Scenes

By A. J. Dickie

In all great industrial achievements an analysis reveals many workers behind the scenes whose combined efforts make possible the sensational successes. A correspondent pays his respects to such workers in the great shipbuilding effort of World War II. In this connection Philip J. Duff writes an eloquent tribute to these planners in the form of a letter to Pacific Marine Review.

"In the October issue of this journal a statement was quoted from the New York Times which is again reproduced for reference. 'When Japan lost a ship she could not replace it. Our losses were many times replaced by new and better vessels. The war at sea was won in United States shipyards.'

"It is true that the mass production of ships in these United States did very materially help to win the war, even to the extent of being a possible major factor, and great credit is due the shipbuilders of this country, old-timers and newcomers.

"However, little recognition, if any at all, has ever been given to the men behind the scenes, the shipyard planning engineers, constructors, purchasing agents and expediters, who did such a marvelous job, and who indefatigably worked day and night, to accomplish the extension of existing shipyard facilities, and design and construct new ones, to make possible this stupendous production on the part of shipbuilders. To these men should go the credit of doing a job well done, in spite of inevitable postwar criticisms.

"It may not be common knowledge, and possibly is known to but few, that this country has been fortunate in the foresight shown, by which studies had been made of shipyards and ship production for some years.

"This article is written, however, as a tribute solely to the engineers, constructors, and collaborators, who by their energies, and resourcefulness, and in incredibly short time, gave to the shipbuilder the wherewithal and opportunity to contribute his share in winning the war, and this tribute is well deserved and a long time overdue."

Our Sincere Thanks for the Many Kind Expressions of Season's Greetings

SS President Wilson, about to be launched at Bethlehem-Alameda shipyard. Right background may be seen stern end of her sistership, SS President Cleveland, which was launched June 23, 1946.

Bethlehem Launches The President Wilson

THE PRESIDENT WILSON, second of the giant passenger liners to be launched since the war for the American President Lines, went down the ways at the Bethlehem-Alameda yard Sunday morning, November 24. She was sponsored by Mrs. E. Russell Lutz, wife of the executive vice president of the Line.

Laid down on November 27, 1944, as a Navy P-2 type transport, the ship was built up to altered plans for peacetime passenger use. She has a length overall of 610 feet, a beam of 75 feet, and a load displacement of 22,574 tons.

The hull is of combined riveted and welded steel construction with a curved stem, a cruiser stern, and with three complete decks and a partial deck, designated A, B, C, and D. Above these are: an upper deck extending from the stem to frame 168; a boat deck covering the midship house; and a navigating bridge deck. The midship house above the boat deck is of riveted aluminum construction which saves some 75 tons in weight at a position where weight saving is important. This use of aluminum is new in merchant ship construction although the U. S. Navy has used this metal on the superstructures of destroyers and cruisers with very satisfactory service results.

Provisions for air conditioning and ventilation are very complete. Air conditioning is provided: for all cabin and tourist class passenger staterooms; for a number of ship's officers' staterooms and offices; for all mess rooms; for tourist and cabin class dining rooms; the library, writing room and shops; and for tourist, cabin and officers' lounge rooms. Mechanical ventilation is provided for practically all the enclosed spaces on the ship. In general, the specification calls for the air supply to all uncooled spaces to be 30 cubic feet per minute for each occupant. Joiner and sheet metal work is being performed by Aetna Marine Corporation. The complete air conditioning, heating and refrigeration system was described in an article by J. W. Markert, chief of Ventilation & Heating Branch, Technical Division, U. S. Maritime Commission, in the August 1946 issue of PACIFIC MARINE REVIEW.

The total capacity of the vessel's lifeboats is 934, or more than enough to take care of the full complement of 890 passengers and crew.

An interesting advance in the design of cargo handling machinery is the side port loading-discharging crane for hatch No. 4 which tops on "A" deck. Two bridges each carrying one trolley and each capable of handling 2½ tons safely are installed for athwartship travel.

The pilothouse, navigating bridges and pilothouse top are equipped with all the most modern devices for making navigation simple and safe.

Gyrocompass system includes one Sperry Mark XIV master gyrocompass and eight repeaters.

An echo depth sounder provides visual and recorder reading of the depth of water under keel. This instrument has a range of from three fathoms up and its readings are accurate within 2 per cent.

Complete equipment for Raytheon radar navigation will be installed so that regardless of visibility the navigation officer will be able to detect any approaching vessel or other large floating object and any landfall in ample time to make any necessary alterations to the vessel's course.

The ship's radio telegraph and telephone installation will consist of four radio telegraph transmitters of various frequencies and four receivers of various frequencies covering all the regular and emergency requirements of a passenger liner radio service. A harbor type radio telephone transmitter receiver takes care of ship-to-shore conversations in or near harbors. Each motor lifeboat is equipped with a radio telegraph transmitter and with a storage battery of sufficient capacity to operate this transmitter receiver continuously for at least six hours.

Electric Galleys

There as three Hotpoint electric galleys on the "B" deck which, in combination with dumb waiter service and pantries, provide food for the passengers, the officers and the crew. These galleys are equipped with the most up-to-date electric ranges, charcoal broilers, coffee urns, baking ovens, mixing machines.

An indication of the many facilities which will be provided for the comfort and entertainment of the passenger is seen in plans for two swimming pools—both cabin and tourist—libraries, sound motion picture facilities, massage rooms, barber and beauty shops and gymnasium. Photographs, oil murals and framed pictures will adorn the walls of the lounges and dining rooms. Kennels are even provided for transporting dogs.

Propulsion Machinery

Boilers: Two Combustion Engineering steam generators; steam at 600 psi and 825° F. at super-heater outlet.

Engines: Two General Electric turbo-electric generator sets; at normal operation on 590 psi and 815° F. with

Mrs. E. Russell Lutz, wife of Executive Vice President of American President Lines, about to christen the President Wilson.

28¾″ of vacuum at condenser, each set produces 7650 kw at 3715 rpm; two 3-phase 60 cycle ac propulsion motors rated 10,500 shp at 3500 volts for maximum continuous duty; at 9000 shp, each of two propellers turns 124 rpm.

Shp normal: 18,000
Shp maximum: 20,500
Speed, cruising: 19.0
Speed, maximum: 21.0
Fuel capacity, tons: 4342
Estimated design cruising range: 17,600 nautical miles (approx.)
Scheduled delivery date—July 1, 1947.

Refrigerated Cargo and Passenger Capacity

Passengers, total	550
Cabin class: 182	
Tourist class: 144	
Third class: 224	
Crew	338
Refrigerated cargo, tons	621

The Launching Procedure

Release of the 610′ liner down the 655-foot ways was accomplished by means of two mechanical launching triggers tripped by an electrical solenoid controlled from the control house underneath the vessel on the port side. The launching triggers were designed in Bethlehem's Fore River Yard in Massachusetts for launching battleships. This mechanism was diagrammed and explained in connection with the launching of the President Cleveland in the August PACIFIC MARINE REVIEW.

When the block-and-a-half long ship became waterborne for the first time, its motion was held in check by means of 350 tons of chain drag, divided into 8 piles and attached to the vessel with 2¼″ diameter drag wires. (See following article on chain and grease.)

The U. S. Coast Guard cleared Alameda Estuary of all water traffic not only during the launching itself but for a period before and after.

Several days before the President Wilson went down the ways, the launching area was searched for underwater obstructions, wreckage and shoals, as well as the underwater portion of the groundway.

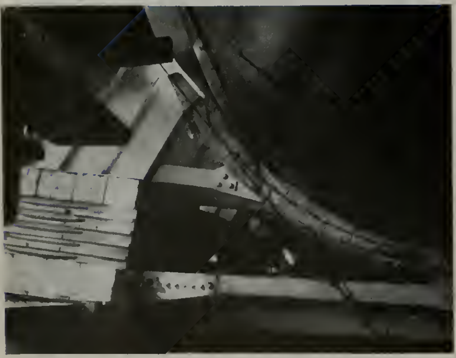
At the time of launching the liner weighed approximately 8300 long tons, including cradle, the heaviest commercial vessel ever to be launched on the Coast.

Eight tons of grease was used on the launching ways, and a launching crew of 165 men helped to launch the President Wilson.

The Yard

Late in 1941 Bethlehem Steel Company was notified by the U. S. Government, represented by U. S. Maritime Commission, it wanted to build 10 troopships. In accordance with this request, a subsidiary of Bethlehem Steel Company was formed and incorporated in March, 1942 as Bethlehem-Alameda Shipyard, Inc. Keel for first troopship laid December 10, 1942. Seven of these troopships (each with a total troop carrying capacity of approximately 5000) were delivered to the Navy during the war. The eighth was commissionel last Fall, and all have now been converted to U. S. Army transport ships for use in the Pacific. The remaining two vessels are the President Cleveland and the President Wilson, fast trans-Pacific luxury liners for the American President Lines.

GREASE AND CHAIN DRAGS IN LAUNCHING PRESIDENT WILSON



Close-up of Starboard forward poppet.

LAUNCHING IS A TIME OF ANXIETY to those responsible, and the anxiety and responsibility increase with the size of the vessel. They further increase as the space available for the launch decreases. In the case of the President Wilson the width of the Oakland Estuary, only 900 feet, is but 290 feet longer than the ship so that obviously some arrangements had to be made to check the ship after she entered the water.

While sliding down the ways and until entry into the water, two forces are acting on the ship and cradle, the weight which gives a component acting down the ways and the force of friction acting in the reverse direction.

The Chain Drags In Operation

The piles of chain, lower left and right in above picture, are two of the six piles used to slow up the ship.

Nicely calculated was the amount of chain needed to stop the ship. Picture shows the dust settling after the chain piles had disappeared.

In order for the ship to start down the ways the weight component must be greater than the force of friction and to insure this being so, the sliding surfaces are coated with grease or a similar lubricant. For the President Wilson the grease used totaled 16,000 pounds.

The grease is applied in two separate operations. First a grease is applied hot to the ground ways which, when cooled and hardened, will produce a smooth sliding surface free from humps and hollows and able to withstand high pressures. Then a grease, similar to automobile grease, is applied to give the proper lubrication between the sliding and ground ways. For the President Wilson the base coat was Paragon Stearine and the lubricating grease Keystone Slipcoat.

As soon as the ship enters the water a third force, that of water resistance, begins to retard its velocity and limit its travel. After the ship leaves the ways she comes to rest when the kinetic energy is entirely dissipated by the water resistance alone, or if the space is limited, by the addition of further resisting forces.

In the past, many methods have been tried to limit the run of a ship after leaving the launching ways. These vary from masks constructed across the stern of the ship, the simple dropping of an anchor or elaborately constructed brakes to chain drags. The method of checking a ship by drags lends itself most readily to direct calculation, is relatively easy to install and does not require any manual control for operation.

For the President Wilson six groups of chain piles, three on each side, having a total weight of 300 tons were used for checking. Each group consisted of two piles of chain each arranged in the shape of a horseshoe with the open end toward the water. This arrangement is used to ease the shock as the load comes on the ship since each pile must pull through before becoming fully effective as a drag. The shock is further eased by having a small amount of slack in the cables connecting the two chain piles in each group.

The chain drags are connected to the ship by three sets of heavy wire ropes so arranged that the groups nearest the water are the first to become effective and do so as the ship leaves the ways. In a properly calculated launching the last group of drags should just pull through as the ship reaches the desired position in the water from the way ends.

The launching weight of the President Wilson including cradle was 8520 tons and she was successfully checked 23 seconds after the chain drags took hold with the bow 153 feet from the way ends. The total travel was 857 feet in 59 seconds.

▲

SHIPS WERE LAUNCHED ON BANANAS DURING WAR

To save scarce costly petroleum products one yard constructing ships for the Maritime Commission was using bananas for "slickum to launch many of the vessels during the Victory Fleet program. These workers are preparing four and one-half tons of banana splits to launch a ship at the Gulf Coast yard.

Ma [illegible]

ALL SLICKED UP

Here the split bananas are being placed in skids under the launching cradle Such use of substitute material helped avoid unnecessary delays in the biggest ship building program of all time.

◄

Your Merchant Marine Pays Off

By ADMIRAL W. W. SMITH, U. S. N. (Retired),

Chairman U. S. Maritime Commission

IF OPPORTUNITY HAS EVER KNOCKED on the door of the Maritime industry, it is beating a tattoo at the present time.

During the war our American merchant fleet, greatest in the world, carried the products of American farms and factories to every fighting front of the United Nations. Our great ports saw the flags of the United Nations in their common task of winning a war. Those same flags still enter our ports to carry on the commercial business of a world at peace, as our American ships continue to carry our products to every country.

The ships of the Merchant Marine know the ports; do the export shippers of the United States know the facilities we offer for delivering their goods to the world?

In war this country developed a great spirit of competition in getting the job done. Competition and incentive built for us the greatest Merchant Marine the world has ever known. They built the things we needed to win a war. We must keep those incentives and that spirit of American competition alive, growing and healthy, in order that our postwar future and the future of the American Merchant Marine may be assured.

In November I visited the city of New Orleans during International Week. New Orleans and the South, with open doors, welcomed representatives from all the Americas and made it clear that New Orleans serves as the great outlet for the Mississippi Valley. They were building good will for American products and for American shipping. Other ports also must lead the way, tell the world, about their outlets for the products of their states and spread the news far and wide to the inland manufacturing plants of the nation. If you have cargoes dockside, the American Merchant Marine was never in a better position to move them swiftly and surely to their appointed destinations. American shippers have at their disposal the finest, fastest ships in any merchant fleet, with well-trained and efficient crews. Ashore the Merchant Marine industry has the "know-how" which can bring success to this program.

There is and will continue to be a world market for American goods. In shipping, foreign competition is growing and will be keen.

Vice Admiral William Ward Smith, U.S.N., Ret., Chairman of the U. S. Maritime Commission.

I would like to preach the principle of shipping American goods in American bottoms, for I believe in that principle. But we know from experience that merchants will ship by the quickest route and the cheapest carrier. Our operating costs are high. But we can meet foreign competition without fear, through reliability of service and efficiency of American operation.

As for the future: According to the best estimates of the Commission's statistical researchers, world sea-borne commerce for the year 1950 should amount to between 275 million and 307 million long tons.

This would be about 2 per cent higher than the tonnage for 1929, the largest previous year on record, and some 19 per cent higher than last peacetime year of 1937.

If world conditions improve, economically and politically, the world tonnage of ocean commerce should approach or even exceed the top figure of 307 million long tons. However, should the world remain in its present unsettled state the lower figure or 275 million is a more nearly accurate estimate.

Although we believe these figures as accurate as it is possible to make them, I should point out that they are dependent upon a number of imponderables which are difficult to foresee and evaluate.

Historically the percentage of ocean-borne commerce carried by American flag vessels has declined from 49 per cent in 1921 to 38 per cent in 1929, to 33 per cent in 1933, and to a low of 22 per cent in 1939.

I sincerely hope that we will not let history repeat itself. Certainly with the production of America at its peak, supplying world markets, our own ships should move a larger share of world trade. The Merchant Marine Act of 1936 says we should move a "substantial portion" and I for one do not consider 22 per cent substantial.

The Maritime Commission believes that the extension of reciprocal trade agreements and the revision of tariffs will make a busy two-way street of international trade. The formation of an international shipping advisory group, either within or without the structure of the United Nations, will go far in solving many common problems in the industry. Experience has shown us the way and I believe we have the "horse sense" to follow through.

Many were keenly aware of the great shipbuilding program of World War I. Hog Island, with its 100 ways delivered ships too late to serve the nation's war need. Our men and materials traveled in foreign flag vessels. We know the results of that war and its effect on our Merchant fleet. Great hulks of steel ships remained at anchor when they should have been carrying American products to the world and returning to America with the things that we need to develop our national economy and human welfare.

That same thing can happen again. We must see that it does not. We will have a well preserved reserve fleet, as directed by Congress, sufficient to meet any national emergency.

The Merchant Marine Act of 1936 gave us a clear directive. The United States needs and must have a Merchant Marine. Our importers and exporters must be assured of prompt and satisfactory American flag ocean services when and where the need arises. For the first time in a hundred years we can offer that vital service between producers and consumers wherever they may be.

The world knows American products and we must keep that knowledge alive.

As you saw war cargoes loaded you probably realized how vital those cargoes and the ships that carried them were to success on the battlefront in defense of our country. I can tell you from personal experience while on duty in the far Pacific that the loss of a single fleet oiler in the early months of war might have required that our Navy Task Force return to Pearl Harbor for refueling. We were thousands of miles from our fuel supply. Had that one tanker, the only one near, been sunk, we would have lost our contact with the enemy and might never have been able to regain that advantage. One tanker! And she *was* sunk at Coral Sea, but fortunately after we had sucked her dry. One tanker! In the Pacific in 1945, thanks to our shipbuilding proclivities, we had more than 500 of these tankers in the pipe line serving our Fleet and our far-flung bases, and we were yelling for more. It may well be said that our shipbuilding shortened the war by at least one year. With the experience of two world wars, I do not believe the people of this nation desire to be caught unawares in any future national emergency.

Coastal and Intercoastal

I should like to pay tribute at this time to the men, the ships and the shoreside personnel of our coastal and intercoastal shipping services for the great part they played in the early days of the war. Prewar, more than 70 per cent of our shipping was in these trades and it was upon them we called for ships to start the war. Without their ships and men the story might have been different. Most of our people were too far from the coastline to have seen our tankers burning off shore. The men and the ships came back for more and delivered the cargoes vitally needed.

The Commission has appealed to the Interstate Commerce Commission for a re-examination and revision of coastwise and intercoastal rates. We want this vital and economic service restored on a going, self-supporting basis. We need it in our economic welfare and in assuring our national security. Right now, we are putting additional government ships in these services to move vitally needed housing materials and other products of the forests and processing plants from one section of our country to another. Private operators are not interested, because the freight does not pay its way.

During the war the government was in the shipping business of necessity. We are still in that business, but are getting out as quickly as private owners can and will take over. By law we must cease to operate as of February 28 next, when government vessels will be withdrawn and the entire operation of our merchant fleet returned to the private owners and operators. We of the Maritime Commission are directed to support such a program, and are desirous of doing so. The Maritime Commission is proud of the reconversion of the merchant fleet to peacetime pursuits.

Our first job when the war was over was the return of American troops and American property from foreign lands. This was accomplished in record time and unlike our previous experiences, was accomplished with vessels flying the American flag.

Our next task was the return of the Merchant fleet to private operation, and to aid those countries which have suffered most at the hand of the aggressor. These two jobs were done at one and the same time. Private ships, with few exceptions, have been returned to their owners; government-owned vessels have been chartered out to private operators. Other government ships under general agency agreements have operated at a profit to the government.

We now have chartered out some 1145 ships. After December 31, 1947, the law permits no further chartering and all ships not sold, domestic or foreign, will be sent to the reserve fleet. We have operating under general agents 830 ships. Such operations must cease February 28 next because on that date accumulated profits in the revolving fund go directly to Treasury receipts, leaving the Commission no funds to pay operating expenses.

Government operation of ships since V-J Day has not been at taxpayers' expense. Currently, our receipts from charter and general agency operation are running at approximately 20 million dollars per month. I cite these figures as evidence that there is profit to be made in the shipping business. We prefer to sell ships, but in the present market, receipts from charter hire pay for a ship in less than three years.

Other receipts for the Treasury:

$2,100,000 per month for British use of ships formerly lend-leased for operation under British flag.

About one billion dollars eventually in payment for ships already sold or in process for sale.

$86,347,200 for disposal of surplus marine material and property.

$35,189,500 from sale by Maritime Commission of 2600 small vessels.

Millions of dollars through renegotiation of war contracts.

The Future

So much for the past. We hope the future holds a bright picture. For the next year we will continue to sell

(Please turn to page 150)

ESSENTIAL UNITED STATES FOREIGN TRADE ROUTES

Trade Route	U. S. COASTAL AREA	FOREIGN AREA
1	Atlantic	East Coast of South America
2	Atlantic	West Coast of South America
3	Atlantic	East Coast Mexico
*4	Atlantic	Caribbean
5	North Atlantic	United Kingdom & Eire
6	North Atlantic	Scandinavia & Baltic Sea
7-8	North Atlantic	Antwerpen/Hamburg Range
9	North Atlantic	Atlantic France & Spain (Vigo to Bilbao)
10	North Atlantic	Mediterranean, Black Sea, Portugal, Spain (South of Portugal) & Morocco
11	South Atlantic	United Kingdom, Bordeaux/Hamburg Scandinavia & Baltic Sea
12	Atlantic	Far East
13	Gulf & Atlantic	Mediterranean, Black Sea, Portugal & Atlantic Spain
14	Atlantic & Gulf	West Coast of Africa
15A	Atlantic	South & East Africa & Madagascar
15B	Gulf	South & East Africa & Madagascar
16	Atlantic & Gulf	Australasia
17	Atlantic & Gulf	Straits Settlement, Netherlands East Indies
18	Atlantic & Gulf	India, Persian Gulf & Red Sea
*19	Gulf	Caribbean & East Coast Mexico
20	Gulf	East Coast of South America
21	Gulf	United Kingdom, Bordeaux & Hamburg, Scandinavia & Baltic Sea
22	Gulf	Far East
*23	Pacific	Caribbean & East Coast Mexico
24	Pacific	East Coast South America
25	Pacific	West Coast South America, Central America & Mexico
26A	Pacific	United Kingdom
26B	Pacific	Bordeaux/Hamburg, Scandinavia & Baltic Sea
27	Pacific	Australasia
28	Pacific	Straits Settlement, Netherlands East Indies
29	California	Far East
30	Washington/Oregon	Far East
31	Gulf	West Coast South America

* Caribbean trade route not shown due to limited space

Matson liners Lurline and Monterey undergoing reconversion at United Engineering Company, Alameda, Calif.

Matson's Plans For '47

By HUGH GALLAGHER, Vice President, Matson Navigation Co.

Hugh Gallagher, vice president, Matson Navigation Company.

THE YEAR 1947 is expected to see the reconversion of all major phases of the Matson Navigation Company to peacetime operation. Upon completion of this program, Matson will be in position to offer travelers and shippers between the United States, Hawaii, New Zealand and Australia one of America's most complete transportation services.

Surface

Surface transportation will be maintained by approximately thirty ships. Comprising this fleet will be three luxury liners, sixteen new C-3 freighters, four C-2 freighters, three Liberty ships and four freighters retained from Matson's prewar fleet. The maintenance of these vessels will be part of the work of the Matson-owned United

Engineering Co. in Alameda and San Francisco. In San Francisco, Seattle-Tacoma, Portland and Los Angeles, cargo operations of this fleet will be handled by Matson Terminals, Inc.

Air

Matson's air transportation will continue under the company's Air Transport Diision on a non-scheduled basis between the West Coast and Hawaii, pending CAB approval for a scheduled Matson air service. The Matson Aviation Maintenance Co. is extending its services to Honolulu. There, as in Oakland where it now functions on a large scale, it will undertake the maintenance, repair, conversion, and overhaul of commercial planes.

1947 will also be marked by the reopening of the Matson's Royal Hawaiian Hotel at Waikiki Beach, completion of a new 7-story wing to the San Francisco offices, and the placing in operation of new bulk sugar loading facilities in Hilo, Hawaii.

Flagship of the surface fleet will be the 26,000-ton passenger liner Lurline, which along with her sister ships, the Mariposa and Monterey, are presently being rebuilt and completely modernized. This project has been undertaken by the United Engineering Company. Modernization of these three luxury ships constitutes one of the largest merchant ship reconversion projects in U. S. maritime history.

Passenger Fleet

Matson's Hawaiian passenger ship service will, as in prewar days, offer weekly sailings in each direction between California and Hawaii. The Lurline, Mariposa and Monterey will be used in this service, calling at San Francisco, Los Angeles Harbor and Honolulu. Matson's subsidiary Oceanic route to New Zealand and Australia (via Honolulu, Pago Pago, Samoa, and Suva, Fiji) will be maintained by the same three ships. Here they will provide a sailing every five weeks in each direction and make ten or eleven round trip voyages yearly to the Antipodes. Each of the three ships will be employed in this route on a rotational basis after several shuttle runs between the two California ports and Hawaii. Until full passenger service is restored by this trio of liners Matson will continue its present interim service between San Francisco, Los Angeles and Honolulu with the Matsonia.

C-3's

Serving Hawaii exclusively, will be 16 C-3 freighters, constituting the largest unit of the postwar Matson fleet. Fifteen of these, to date, have been allocated by the Maritime Commission to Matson for purchase. The C-3's will be converted for the handling of the specialized cargoes peculiar to the Hawaiian trade. On ships of this type assigned to routes between the West Coast and Hawaii, particular attention will be paid to refrigerated cargo, for which 60,000 cubic feet is being made available on each vessel. The most advanced type of equipment for this service will be installed, providing a sustained temperature of ten degrees below zero. Deep tanks on each of these vessels will be altered to accommodate 2,700 short tons of molasses, loaded and discharged by special pumps capable of handling 250 tons per hour. Extensive alteration in hold arrangement, including permanent sheathing, will also be made to accommodate bulk sugar consignments. Topping lift winches will be added at all hatches.

With the availability of the new freighter fleet, Matson will offer the following express cargo service to Hawaii over four routes:

1. Direct weekly sailings from San Francisco.
2. Direct weekly sailings from Los Angeles.
3. Direct fortnightly sailings from Seattle-Tacoma and Portland.
4. Weekly sailings (in conjunction with Isthmian Steamship Co.) between Atlantic Coast ports, including regular calls at Gulf ports and Hawaii.

Libertys

The Pacific Northwest-Hawaii C-3 service will be augmented by three Liberty ships which Matson has already purchased, and which will afford frequent sailings from that area with lumber, sulphates and other cargoes.

In transit time, these postwar freighter services will offer approximately a 30 per cent increase in speed over the prewar freighter fleet. The C-3's will make the run between California ports and Hawaii in 5½ days; between Pacific Northwest ports and Hawaii in six days, as compared with seven to eleven days required before the war. Almost a full fortnight will be cut from the Hawaii-East Coast service, where the transit time will be reduced from thirty days to seventeen. Utilizing the C-3 and Liberty ships to fullest advantage, with fast and fre-

THE TURBINES

The Lurline, Monterey and Mariposa were built at the Bethlehem Quincy Yard in the late twenties for transpacific service, and the turbines are being returned to Quincy for rebuilding and overhaul. New casing will be made for the intermediate pressure engines and a change made from cast iron to cast steel in material used for foundry work. Rebuilding will include reboring and reblading, in which work Quincy has a staff of experts.

Each ship has six engines; low pressure, intermediate pressure, and high pressure, operating three to a propeller shaft on twin screws. The high pressure engines have withstood service and won't be rebuilt.

S.S. LURLINE, flagship of the Matson fleet

At right: Master of the Lurline is Commodore C. A. Berndtson who was made Commodore of the Matson Fleet in 1937. He first sailed with Matson in 1916, as a Quartermaster on the Manoa, and commanded the Lurline since 1932.

quent sailings, Matson will offer a service surpassing anything ever before attempted on the Hawaiian route.

C-2's

In addition to the express general and refrigerated cargo service which the 21-knot Lurline, Mariposa and Monterey will provide on the Oceanic route, four C-2 freighters will be assigned to this run. These freighters will service all major U. S. Pacific Coast ports and will call as cargo offers at such ports as Auckland and Wellington in New Zealand; and Sydney, Melbourne, Brisbane and Adelaide in Australia. However, final schedules and ports-of-call for this cargo service are still being formulated. Negotiations for purchase of the four C-2's are currently under way with the Maritime Commission. When delivery is made, they will be modified with particular attention to the carriage of lumber, bulk lube oil, and to suit other requirements of Oceanic's trade routes. Because of material shortages and labor disturbances the conversion of these C-2's as well as the C-3's has dropped behind schedule, but it is hoped that most major modifications will be completed during the year.

The balance of Matson's surface fleet will be four or five of the prewar freighters which will be retained

S.S. MONTEREY

At left: Captain Elis R. Johanson joined Matson in 1920, as Master of the Mohenkis, and has had command of the Monterey since 1934. His Santa Elena rescue is believed the largest in history.

S.S. MATSONIA

Captain Frank A. Johnson, with Matson since 1923, has commanded the Matsonia since 1935. While he served as Port Captain for 15 war months, Captain H. R. Gillespie took over the ship.

mainly for use as replacements and to handle peak loads. No scheduled services have been set for these vessels.

Material Handling

To help offset the rising costs of cargo operation, Matson Lines, in common with most steamship organizations, is constantly seeking more efficient methods of materials handling. One such development—the shipment of sugar in bulk from Hawaii to the mainland—was described in the August, 1946, PACIFIC MARINE REVIEW. In addition to reducing handling costs, bulk shipment materially increases ship efficiency in stepping up turn-around time. So successful has the new bulk operation proved, that Matson plans to extend its use. At the present time, the port of Kahului has this facility and sometime during the coming year, at cost of approximately $1,000,000, Matson will complete construction of a plant for the storage and shipment of bulk sugar at Hilo, Hawaii. Present plans call for eventual construction of similar plants at two other Hawaiian ports. In accordance with this long-range program, all but a small

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S.S. MARIPOSA

At right: Captain William R. Meyer has been Master of the Mariposa since 1932. When commanding the Ventura his dramatic rescue of passengers and crew of the stricken Tahiti aroused world-wide interest.

◄ George A. Pope, Jr., President of Pope & Talbot.

Charles L. Wheeler, Executive Vice President. ►

Pacific-Argentine-Brazil Line Restored by Pope & Talbot

POPE & TALBOT, INC., is resuming liner operations between Pacific Coast ports and the east coast of South America with the re-establishment of its Pacific-Argentine-Brazil Line (West Indies Service) early in February. This direct service via Panama and Puerto Rico to the important ports of the east coast of South America marks the resumption of a 16-year freight and passenger service pioneered by Pope & Talbot immediately following World War I, which was necessarily terminated prior to World War II.

The action of Pope & Talbot, Inc., follows a recent extensive tour and survey of the 17,200 mile trade route by President George A. Pope, Jr., and submission of his report to the directors of his company showing that there is an urgent need for additional service between the Pacific Coast and East Coast South America ports. The company will also resume its pre-war status in the existing conferences of steamship associations covering this route.

"Prospects for West Coast trade expansion into South America were never better," states Mr. Pope. "The tremendous increase in industrialization of the west coast of the United States has a counterpart in the great cities of the east coast of Brazil and Argentina, with corresponding increases in population and economic prosperity. There is a new appreciation by both hemispheres of the necessity for an expanded, free-flowing commerce to fill and satisfy the needs of both."

Modern, fast vessels of the Pope & Talbot Lines fleet will be allocated to the Pacific-Argentine-Brazil Line with the St. Cloud Victory scheduled to sail on February 12. PAB Line ships will sail from British Columbia, Puget Sound, Columbia River, San Francisco Bay Area and Los Angeles ports to Puerto Rico, British West Indies, the Brazilian ports of Rio de Janeiro and Santos, Buenos Aires in Argentina and Montevideo, Uruguay.

In announcing plans of his company, Charles L. Wheeler, executive vice president, points out that West Coast exporters and importers seeking the products of those countries, will have the benefit of experienced personnel at all ports along the line. Most of their former agents will resume with them and include: Juan J. Reynal of Buenos Aires; Federal Express Company of Brazil; Christophersen & Cia of Uruguay; Rafael Del Castillo & Co., of Colombia; Curacao Trading Company of Dutch West Indies; W. Andrews & Co., of Panama Canal Zone. The company has its own office at San Juan, Puerto Rico. Kingsley Navigation Co., Ltd., Vancouver, B. C. will continue as British Columbia representative.

"This means complete familiarity with the needs of their country," stated Wheeler, "as well as experience in the kind of service American exporters and importers desire. The resumption of this vital service between Pacific Coast ports and the countries of the Caribbean and east coast of South America, should be an important factor in the expansion program for industry, and the development of foreign trade at all our ports of call. Not to be overlooked is the fact that Pope & Talbot, Inc., is a wholly owned and operated Pacific Coast company, hence the same viewpoint and desire for building the economic stability of the West that motivates western industry throughout. Prior to the inauguration of the Pacific-Argentine-Brazil Line in 1926, the only water transportation between the east coast of South America and Pacific Coast ports was to be obtained from tramp line service."

The Pacific-Argentine-Brazil Line offers West Coast shippers and importers a splendid opportunity to stimulate foreign trade. This direct service is widely regarded as having been instrumental in the great development of the Pacific Coast as a coffee and chocolate center, as well as for less publicized products such as wax, nuts, spices, drugs, bones and fertilizers. As an outlet for Pacific Coast products, the route was important in developing markets for rice, lumber, paper and hundreds of other manufactured products.

In re-establishing the Pacific-Argentine-Brazil Line, Pope & Talbot is carrying forward the tradition of pioneering which began with the establishment of the company on the Pacific Coast in 1849, and which has carried the American flag and American commerce to all parts of the world. Pope & Talbot Lines also operate Pacific Coastwise Service, Pacific Ports to the Caribbean, and Intercoastal service between Atlantic and Pacific Ports.

Pacific Shipping Prospects And Problems

By A. W. GATOV,

Secretary, Pacific American Steamship Ass'n.

Albert W. Gatov, executive director, Pacific American Steamship Ass'n.

EXPANDING THE THOUGHT THAT THE PROSPERITY of Pacific Coast shipping is tied to our general national economy, it is axiomatic that As Goes the World's Business, So Will Go Shipping. Transportation, existing as it does as a means to an end, rather than as a separate entity, is obviously supersensitive to industrial trends, and being an instrument of national policy, it is affected by this country's position in the world political scene.

Considering the persistent tendency toward forecasting gloom on the part of some of our heavy-duty economists, it has not been without considerable courage that Pacific Coast ship operators have embarked on large-scale programs for keeping U. S. Flag shipping in a dominant position. Recognizing that only the relatively immediate future permits very much in the way of prophecy, while shipping is substantially a long-term risk, considerable of this courage has perhaps been fostered by hope and speculation, but hope or speculation by experienced shipping men is something to tie to.

Even a trial balance at this time of the known debits and credits is affected by so many unknown factors that it would be folly to suggest what lies very far in the future for shipping. But this year looks brighter for some trades—uncertain for others.

It is encouraging to note that Pacific Coast operators are retooling, expanding and implementing plans for a resurgence of the Pacific trades with American tonnage.

On the credit side, and through the circumstances of the war, a substantial fleet of newer, faster, and more economical ships has been made available in some of the Pacific trades. Much enthusiasm arises from the elimination of the once important Japanese merchant fleet. The major trade routes of the Pacific will be dotted with a preponderance of American ships. And American ships are American assets in more ways than one! First, they operate from American ports, and carry American goods and American crews. Second, their major repairs must be made in American shipyards. Third, insurance on ships and cargo will be largely American, and so will financing. Finally, raw material imports will reach American factories when world supplies are short.

In all Pacific trades there is the vast interim tonnage occasioned by war-created demand for practically the whole range of exportable commodities. This demand is likely to continue far into the future. Wherever American servicemen have been, American goods have become known.

In the domestic and non-contiguous routes, there is a strong demand for reconversion goods, long denied production and distribution in our wartime economy. Though by no means a healthy situation, the intercoastal and coastwise trades are finding considerable additional support by virtue of the rail car shortage.

On the other side of the ledger we must not lose sight of the fact that we have no exclusive rights in our Pacific foreign trades. The traditionally strong maritime nations are making come-backs. In addition to Great Britain and the Scandinavian countries, China and Russia may emerge as strong contenders for Pacific tonnage.

In some quarters there is expressed the opinion that the almost legendary "Pacific Boom" has been over-sold, and that the possibilities and attractions it offers have been more than met by the rush of prospecting foreign operators drawing off tonnage from other routes and tramp services.

Though it is assumed that currency fluctuations, foreign loan difficulties, and credit problems may within a reasonable time attain a semblance of stability, they have been discouraging drawbacks to promotional exporting. Perhaps short-sightedly, many manufacturers and distributors neglected their export field in the face of an unprecedented domestic demand. To capitalize by taking the initiative, England, for example, has pursued a long-range export policy in spite of domestic shortages, many of which are of a far more serious nature than anything encountered in this country. As a result of this policy, we now find England far above her prewar expott averages, and the results are quite evident when this is translated to shipping terms. The vital importance of world trade to shipping suggests that organized importation efforts be made by steamship companies with the same careful planning that they exert for passenger business. As normal price levels are reached, however, import volume will grow naturally.

On the operating side, of prime importance is the competitive position of U. S. Flag shipping in respect to costs. The total labor costs of an American-crewed Liberty-type ship amount to $11,480 per month, against a British crew for the same vessel at $4,300 per month, and substantially the same disparity for Dutch, Swedish, Norwegian and Greek vessels.

In the domestic trades, where rate structures are inevitably tied to those of other forms of transportation, the situation regarding cost increases is even more grave. The laborious process of adjusting postwar rates and practices to postwar costs and conditions has given the domestic carriers little encouragement on which to base definite plans for resumption on a private basis.

In a report submitted to the M. C. by its Postwar Planning Committee, it is pointed out that in 1939 we had a total of a little over *two and a quarter million deadweight tons* of dry-cargo shipping engaged in foreign trades. On the basis that our foreign trade increases fifty per cent by weight, and that we handle at least half of our export traffic, the Committee estimated that off-shore trades could support *four million deadweight tons.* Our volume increase is already rising rapidly.

In 1939, the domestic coastwise and intercoastal routes each supported roughly one million three hundred thousand deadweight tons. Even with the best of conditions traffic-wise and rate-wise, optimistic estimates are that these trades could currently support a maximum of one million tons each. In the non-contiguous trades, the 1939 figure of slightly over four hundred thousand tons is expected to be increased to a little over a half-million tons. Whether there will be a realization of a merchant marine of a size envisioned by the Maritime Commission's Postwar Planning Committee, remains to be seen. In any event, the industry finds itself at this time with at least the basic ingredients for success—modern fleets and trained personnel. But there are other factors. The enormously increased population of the West, with a consequent increase in the shuttling of freight and passengers; the industrial expansion of the West; the apparently increased attention to shipping problems by governmenr agencies.

Notwithstanding the governmental and public interest in a wartime merchant marine, there is too little realization of the peacetime functions of shipping, and what a strategic part it plays in the every-day life of our nation.

The announced intention of Congress, which has been repeatedly stated in successive merchant marine acts, is that there shall be fostered and encouraged, a privately owned merchant marine in domestic and foreign commerce, adequate for carrying a proper share of the commerce of this nation.

Shipping's big job is to stimulate widespread interest, and to improve public knowledge of our stake in a first-class merchant marine. The objective is to make our national merchant marine policy a statement of fact, rather than a mere statement for the records.

Transpacific Shipping An Estimate

By THOMAS E. CUFFE,

vice president and general manager, Pacific Far East Line, Inc.

THE CURRENT AND FUTURE PICTURE of transpacific shipping generally is favorable. It appears, however, that until the return of normal trade conditions—still some time in the future—the interim period will be spasmodic and marked by occasional slumps.

As well as can be judged today, transpacific shipping will be excellent when normalcy returns. The reconstruction programs for both China and the Philippines scarcely have been started. There is a very great backlog to be met for materials of all kinds—rebuilding old industries and construction of new ones; new docks, terminals, warehouses, and transportation facilities, including railroads and trucks.

The immediate outbound shipping picture is satisfactory, with a relatively heavy movement of all types of commodities. Qualifying this is the periodic congested terminal situation in many major Oriental ports. According to latest advices from the Philippines, Manila will again be congested with the arrival there of vessels now en route. Cause of the congestion is lack of terminal and shoreside facilities. No permanent relief can be expected until these facilities are provided.

Homebound cargoes from the Orient are scarce and, with the exception of copra, are not in any volume. An improvement is hard to forecast because it is contingent on so many political and economic factors in the Far East.

Present indications point to very keen competition between steamship lines, foreign as well as American. The prewar list of transpacific companies has been augmented by many newcomers so that the gap left by the elimination of Japanese shipping is being well filled.

Pacific Far East Line's part in transpacific shipping at present embraces the operation of a fleet of twenty-four vessels in a regular California-Orient service, including nine fully refrigerated vessels. This fleet provides frequent service with rapid transit time.


Thomas E. Cuffe

Future plans also include operation of five C-2 vessels recently purchased—the Midnight, Sirocco, Tyrell, Star, and Towner, as well as purchase of at least three of the fully refrigerated vessels currently under charter. The Midnight went into service mid-December. She will be followed by the Sirocco mid-January and the others as their reconversion is completed. These ships are full scantling type, 10,800 deadweight tons, 15½ knots, with deep tank facilities and refrigeration space. The regular berth service and refrigerator schedule will be augmented with calls at North China and outports throughout the Far East, handling largely bulk cargoes.

Granted that shipping prospects may not be overly optimistic for the immediate future, we are confident nevertheless that over the long range the handicaps to expanded trade will be overcome and that shipping in the Pacific will play a dominant part in world economy.

New Ships for the Pacific And 'Round-the-World

By EUGENE F. HOFFMAN, Director of Public Relations, American President Lines


Eugene F. Hoffman

ALMOST DAILY WE ARE BOMBARDED with such question as, "What will your new transpacific liners be like?" "How will they compare with the late luxury liners President Hoover and President Coolidge?" "What about your Round-World cruise ships?" "Will you operate the same type of equipment and over the same route as prewar?"

Insofar as American President Lines is concerned its two main trade routes — transpacific and Round-the-World—will be serviced by a fleet of fine new luxury liners and combination passenger-cargo ships which, from the standpoint of passenger comforts and safety and modern cargo facilities, will be second to no ships in the world.

To quote the designers of these vessels, "There may be bigger ships afloat, but certainly none finer or more modern. The new President liners represent the epitome of present-day knowledge in the shipbuilding crafts. They combine engineering skill and efficiency with all the luxuries of ocean-going transportation."

Rapidly nearing completion at Bethlehem Shipyards, Alameda, California, are the two largest commercial ships ever constructed on the Pacific Coast. They are the SS President Cleveland and the SS President Wilson, ordered by the Maritime Commission specially for American President Lines' transpacific service.

Launched June 23, last, the President Cleveland is currently scheduled for delivery April of next year. The President Wilson was launched November 24, and is tentatively scheduled for delivery July 1, 1947.

Combining the latest design in passenger accommodations with the most modern machinery and equipment obtainable, these two 22,900-ton luxury liners will each carry 552 cabin and tourist passengers and a crew of 338, in addition to mail, refrigerator and express-package cargo.

The ships are 610 feet in length and 75 feet wide. Their 20,000 horsepower turbo-electric motors will propel them at a maximum speed of 21 knots.

Both vessels were originally laid down as Navy P-2 type troop transports, but with war's end, the Maritime Commission ordered them constructed according to American President Lines' specifications for the latter's fast-growing transpacific passenger and express-cargo trade.

The Presidents Cleveland and Wilson will boast two swimming pools—one each for cabin and tourist passengers—libraries, sound motion picture facilities, massage rooms, barber and beauty shops and gymnasium. All cabins and public rooms will be air conditioned. There will even be steam-heated kennels for dogs and other pets.

These new luxury liners will ply between the California ports of Los Angeles and San Francisco and Manila via Honolulu, Japanese ports (when opened), Shanghai and Hong Kong.

In the meantime American President Lines is meeting the heavy demands of postwar emergency trade and travel with a fleet of ships chartered from the United States Government plus two vessels of its prewar fleet which were turned back by the Navy, and six new C-3 type freighters recently built for the President Lines by the U. S. Maritime Commission. These latter are modern 17-knot cargo ships with luxurious stateroom accommodations for a maximum of 12 passengers. They operate transpacific.

Principal transpacific passenger carriers in the Company's emergency or interim fleet are the SSs General M. C. Meigs and General W. H. Gordon, former Navy troop transports which were given limited conversion to accommodate 1500 commercial passengers each, and the SS Marine Lynx, a C-4 type troop transport converted to accommodate 1000 passengers.

In the Round-World service are the newly converted passenger liners, President Polk and President Monroe, each with luxurious accommodations for 97 passengers. Nine other ships temporarily scheduled in the Round-World fleet are all C-4 type freighters, with the usual commodious quarters for a limited number of passengers.

As soon as the President Cleveland is available for service next spring, one of the "General" ships will be placed in dry dock and given a complete reconversion job that will qualify her to serve as part of President Lines' permanent trans-Pacific passenger fleet. Later, when the President Wilson enters service (mid 1947) the other "General" will be given similar total reconversion. Thus, eventually American President Lines will have a well-balanced fleet of four large de luxe passenger liners in fast trans-Pacific service, providing total recommendations for more than 2200 passengers.

The Company's popular Round-World service is being resumed with two virtually new passenger liners—the afore-mentioned President Polk and President Monroe—plus the nine freighters with limited passenger accommodations. The President Polk is so new that it is only now completing its Maiden Voyage, commenced December 7, 1941, and then halted by the Japanese attack on Pearl Harbor. After a tour of war duty, the Polk was reconverted to commercial use, then sailed again (from San Francisco August 21, 1946) to conclude the Maiden Voyage started nearly five years before.

A sistership, the President Monroe, likewise, after a tour of duty as a Navy combat trooper, was given a complete restoration to commercial use and is now being readied to take her place in the Round-World schedule.

These ships are 492 feet over-all, 70 foot beam, and have a cruising speed of 17 knots. They displace 16,716 tons and gross 9,260 tons. Although just prior to the war seven such vessels were designed and built especially for American President Lines' Round-World service, it is now indicated that somewhat larger ships will be required to meet adequately the expanding postwar demands of this popular global trade route, which has been certified as one of the essential American flag services.

As a result of these observations the Maritime Commission and American President Lines are working on plans for an entirely new type of vessel for the Company's new Round-World fleet. Technically known as the "V-2000" type, as distinguished from the C-3-P design, the proposed new globe-girdler will practically double the passenger accommodations of the Polk-Monroe type (189 as against 97), and carry considerably more freight (gross tonnage 11,250 against 9,260).

The new "V-2000" would be 536 feet over-all, which is 44 feet longer than the Polk-Monroe type; 73 feet wide and maintains a cruising speed of 19 knots. Its deadweight would be 11,660 tons. This ship will be the last word in sea-going elegance and efficiency.

If approved by the Maritime Commission a total of five such de luxe liners would be constructed to replace the interim C-4 freighters and operate in a seven-ship schedule with the Presidents Polk and Monroe.

The Company's well-established itinerary westward Round-the-World, over which for almost a quarter of a century President liners have been calling at twenty-three fascinating ports in fourteen countries, will be

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50 APL Ships in 60 Days

One of the largest peacetime steamship operations in American maritime history was outlined on December 20 by M. J. Buckley, vice president in charge of freight traffic for American President Lines.

Calling attention to the President Line schedule for December and January, Mr. Buckley pointed out that a total of thirty-two Company vessels were on berth this month at Atlantic and West Coast ports destined for China and the Philippines, and that thus far eighteen sailings are scheduled for January.

He explained that this heavy schedule was not to be construed as a normal APL operation, but resulted from congestion caused by the maritime strike plus the unusually heavy demand overseas for American cargoes.

"I do feel, however," said Mr. Buckley, "that it is quite an achievement when our Company handles in stride an operation of this magnitude—more than fifty large off-shore vessels within a period of sixty days.

"You don't have to worry too much about your American Merchant Marine when one of its member units can turn in a performance like that."

M. J. Buckley
Vice President — Freight Traffic

First Dollaradio station built at Mussel Rock in 1928. Communication was maintained between this radio station and the S. S. President Taft of the Dollar Steamship Line on its voyages across the Pacific. Also nightly contact was made with the Admiral Byrd expedition at Little America.

Globe Wireless Station KTK Restores Marine Service

Close up view of Mussel Rock Transmitting Station, of Globe Wireless Ltd., located 15 miles south of San Francisco. Here are housed the high powered transmitters used in transpacific communications service.

"CALLING ALL SHIPS AT SEA—KTK, the Globe Wireless Marine Station at Mussel Rock, is back on the air with 24-hour service to all ships at sea." This message was cracked over the airlanes of the sea on December 7, 1946, the fifth anniversary of Pearl Harbor Day, and sent by Globe's President, R. Stanley Dollar.

From the time Captain Robert Dollar first visualized a vast communications system linking all of his offices and ships at sea, until the transmitters were silenced on December 7, 1941, the log of Station KTK was filled with accounts of romance, adventure and stark tragedy on the high seas.

As the five-year silence ends it is recalled that the operators on duty at KTK on that ill-fated Sunday morning (December 7, 1941) heard what was probably the first overt act of the war, inasmuch as it occurred prior to the planes at Pearl Harbor. A frenzied call came from the Matson steamship Lurline, which had just sailed from Honolulu, saying it had intercepted this distress call from the freighter Cynthia Olson, "SSSS Am being attacked by submarine." The astounded operators called the Navy immediately and placed the matter in their hands.

A few minutes later the Globe Wireless marine station at Honolulu reported that Pearl Harbor was under attack and such on the scene observations as "planes overhead, ground shaking from bombs," etc., followed.

Then came the important task of notifying all ships at sea of the attack and requesting them to place in operation prearranged Navy Department plans.

During that never-to-be-forgotten Sunday, the operators at KTK listened to word by word accounts of the

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Swedish motorships Boogabilla and Barranduna at CPR Pier A at Vancouver, B. C., represented on the Pacific Coast by General Steamship Corporation, Ltd.

General Steamship—Fast Pace Set by Agency Lines

By H. S. SCOTT, President, General Steamship Corp., Ltd.

Harry S. Scott, General Steamship Corp., Ltd. president.

THE PROGRAM OF THE GENERAL STEAMSHIP CORPORATION for the coming year will be directed toward the further re-establishment of the various lines which it represents on the Pacific Coast and will mark a continuance of reconversion to a peacetime commercial basis of operations, which is now well under way. Acquisition of tonnage to replace war losses suffered by most of our lines is proceeding satisfactorily.

During 1946, we have welcomed the return of the French Line to the Pacific Coast, and in 1947 this company will be able to give a service with frequency of sailings comparable to prewar. This will be maintained primarily with Liberty ships which have been purchased from the American Government and which, in turn, will be replaced by rapid and more up-to-date vessels now contracted for in French and other European yards.

In the South American trade, the Westfal-Larsen Company Line, which suffered heavily from the war casualties, will be back in operation on a normal basis. This has been made possible through the acquisition of a

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With the Naval Architects & Marine Engineers

THE ANNUAL MEETING OF THE SOCIETY of Naval Architects and Marine Engineers, held November 14 and 15, 1946, at New York, brought out eight very interesting papers. Two of these papers treated marine engineering subjects, two were general, four were on naval architecture. Of the eleven authors, seven are in design and research, three are in executive engineering positions and one is a retired U. S. Coast Guard Engineer-in-Chief.

A brief summary of each paper is presented herewith.

Design of Stacks to Minimize Smoke Nuisance

By Robert W. Nolan

The author is in the Engineering Technical Division of Newport News Shipbuilding and Dry Dock Company and bases his paper on research carried out on ship models and stack models in a wind tunnel. Models of such ships as USS America, Talamanca, and California were used as well as some models of proposed new ships.

The smoke problem is a comparatively recent problem due to the use by designers of large low stacks for streamlined appearance. The old thin tall natural draft stacks lifted the smoke sufficiently to avoid any smoke nuisance on deck or in quarters.

This research led the author to conclude: that forming an annulus between inner and outer stacks so as to produce a high velocity air jet surrounding the smoke is very beneficial; that the ratio smoke velocity divided by wind velocity should always be above unity and preferably much higher; that the ratio of stack height to height of fidley should approximate 1.75; that the top of stack should be designed to keep the diameter "as small as possible and reduce the unused area" to a minimum; and finally that "complete elimination of all smoke nuisance at all times is probably impossible with stack heights that would be acceptable to the public."

The paper and the further research into this subject promised by the author should be of great interest to designing naval architects.

Turning and Course Keeping Qualities

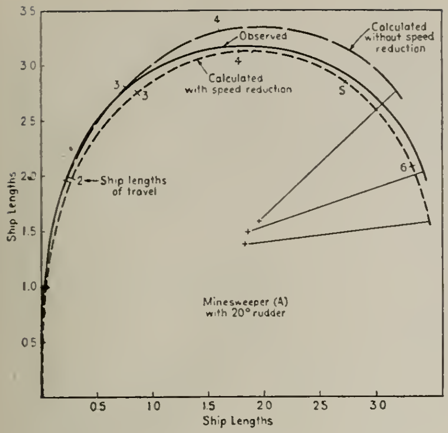
By Dr. Kenneth S. M. Davidson and Dr. Leonard M. Schiff

These authors are respectively: Professor of Mechanical Engineering and Director of Towing Tank, Stevens Institute, Hoboken, New Jersey, and Associate Professor of Physics, University of Pennsylvania. The paper is in

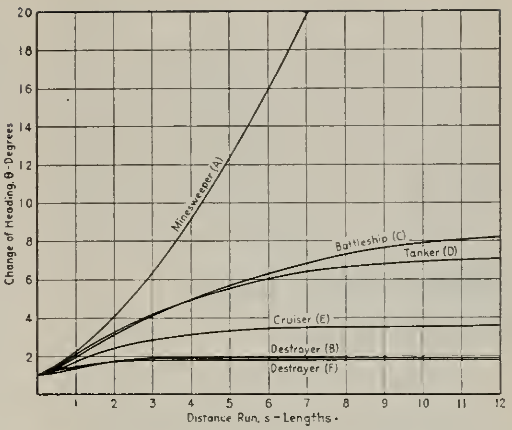
STACK CHARACTERISTICS OF TYPICAL VESSELS

Item	Ship	Date	Horse-power	Gross tons	Length b. p (*L*), ft	Speed, knots	Approx. outer stack section, ft	Number of stacks		Fidley height above water, *hf*	Stack height above water, *hs*	Stack height above fidley	Ratio *hs/L*	Ratio *hs/hf*	Smoke velocity (*S*), fps	Smoke velocity ÷ wind velocity,[a] *S/W*
								total	active							
1	*Deutschland*	1900	36,000	16,500	663	23.5	....	4	4	39	84	45	0.127	2.15	..	.
2	*Mongolia*	1904	10,000	13,600	600	16	11.75 × 15.25	1	1	42	94	52	0.157	2.24	12.3	0.45
3	*Lusitania*	1907	70,000	30,800	760	25.5	16.6 × 23.6	4	4	53	117	64	0.154	2.21	9.3	0.22
4	*Imperator*	1912	62,000	52,200	884	22	....	3	2	80	150	70	0.170	1.88	..	..
5	*Aquitania*	1914	56,000	45,600	869	23.5	17.5 × 24	4	4	66	126	60	0.145	1.91	8.1	0.20
6	*California*	1928	17,000	20,200	575	18	19 × 24	2	1	57	98	41	0.170	1.72	7.4	0.24
7	*Europa*	1928	90,000	49,700	890	26.25	20 × 47.5	2	2	85	114	29	0.128	1.34	11.2	0.25
8	*Talamanca*	1931	11,000	7,000	415	17.5	12 × 17	1	1	37	79	42	0.191	2.13	10.5	0.35
9	*Lurline*	1932	22,000	18,000	605	20.5	17.5 × 25.5	2	2	62	102	40	0.169	1.64	8.7	0.25
10	*Queen Mary*	1936	200,000	81,200	975	30	20 × 35	3	3	86	142	56	0.146	1.65	17.3	0.34
11	*America*	1940	34,000	26,500	664	22.75	20.5 × 42	2	1	65	113	48	0.170	1.74	28.6	0.74
12	*President Monroe* (C-3 type ship)	1940	8,500	9,300	465	16.5	18 × 35	1	1	49	76	27	0.163	1.55	13.4	0.48
13	Liberty ships	1941	2,500	7,200	417	11.5	9 × 11	1	1	33	53	20	0.127	1.60	15.6	0.80
14	Victory ships	1943	6,000	7,600	437	15.5	9.83 × 12	1	1	34	62	28	0.142	1.82	15.4	0.59

[a] Assuming wind velocity W to be equal to ship speed in feet per second.



Comparison of observations and calculations of entry to steady turn.



Change of heading vs. distance run, in lengths, for the six types of ships. Initial disturbance equals 1° yaw, with no angular velocity.

three parts: (1) Broad Considerations Applicable to Free Bodies in General, (2) Seagoing Ships, (3) A Formal Analysis.

Turning ability has a well recognized index—the numerical ratio (D/e) min. between the minimum turning diameter with rudders hard over in quiet fluid, and the length of the body. Ease of steering has no similar numerical index recognized by the profession. The authors work out such an index for dynamic stability and propose its use in theoretical design. This index p, is negative for dynamic stability and positive for dynamic unstability. For seagoing ships of average size this index should be in the range of –0.3 to –0.4 and the range of –0.15 to –0.6 would cover the normal range of sizes of seagoing craft. The negative value of p may be less for the larger ships and generally must increase for smaller size vessels. For any vessel the curves of total moment with rudder amidships have a marked correspondence with p. If these curves at origin have a positive slope then p will be positive (unstable) and the vessel unsatisfactory from the steering viewpoint.

This paper is essentially a second progress report on a broad program of research sponsored by the U. S. Navy and carried on at the Stevens Institute Experimental Towing Tank. While the results are still largely mathematical, this research promises some very interesting practical results in design.

German Wartime Technical Developments

By Commodore Henry A. Schade, U.S.N.

Commodore Schade is the director of the Naval Research Laboratory at Washington, D. C., and this paper is a "synthesis of information contained" in the report of the U. S. Naval Technical Mission in Europe. Design features and construction of submarines and surface vessels for the German Navy, turbines and gears, diesel engines, and the Hamburg Model Basin are the general subjects covered.

Of turbines the author states, "As compared with American machinery, the following statements seem well substantiated:

(1) Overall fuel consumption rates are higher.
(2) Turbine heat and steam rates are higher.
(3) Reduction gear efficiencies are poorer.
(4) Weights per unit output are greater.
(5) Space requirements per unit output are greater.
(6) Accessibility is far poorer.
(7) Reliability is probably poorer.
(8) Difficulty of production is greater.
(9) Large scale production is definitely more difficult."

Notwithstanding these adverse comparisons the author believes that the Walter submarine turbine plant designed to run on CO_2 and water vapor, can "equal or exceed anything produced in this country so far for powering a ship." The 2500 hp unit used in the submarine type XVII is a 14 stage single flow reaction rotor turning 14,000 rpm with a first orthodox helical gear reduction to 3770 rpm and a further planetary gear reduction to 580 rpm. This gear weighs 0.83 lbs per shp as compared with approximately 5.5 lbs shp for our most comparable unit. The nozzle operating fluid condition is 412 psi and 1022° F total temperature, with 7 lbs gage exhaust pressure. Those who are interested can get full details of the facts found in Europe by the Navy Technical Commission through the Publications Board

(John Green) Department of Commerce, Washington, D. C.

A survey of the work of the Hamburg Model Basin closes with this rather sad paragraph:

"With the occupation of Hamburg by British troops in May, 1945, the activities of the Hamburg Model Basin came to an end. German personnel were evicted and the two cavitation tunnels were dismantled and shipped to England. In the latter months of 1945, the model basin walls were blasted and the tanks were filled with brick and stone rubble from the littered streets of Hamburg."

Alternating Current for Auxiliaries On Merchant Vessels

By Benjamin Fox and Harry C. Coleman

The authors of this paper are respectively: Superintendent, Engineering and Design, Central Technical Dept., Bethlehem Steel Company, Shipbuilding Division; and Manager, Marine and Aviation Division, Westinghouse Electric Corporation.

A very interesting comparative analysis of the electric auxiliary plants in ships which leads to these conclusions.

Alternating-current drives have been applied successfully to practically all important marine auxiliaries. The outstanding exception is the cargo winch. For this service the application of alternating current is now under intensive development but, until satisfactory test and service experience is available, direct current drives will be practically universal.

The principal considerations that should govern the selection of alternating curent or direct current for merchant vessels are:

(1) When the total electrical capacity required is quite small, and particularly when there are only a few small motors, the direct current system will be preferred for simplicity and low cost.

(2) For larger plants, the alternating curent system offers important advantages which increase rapidly with the capacity of the plant and the number and rating of the motors.

(3) Maximum advantage is obtained, in these larger plants, when substantially all the equipment is alternating current. This of course does not preclude the use of direct current, by motor-generator set, for minor serv-

TABLE 1.—SHIPS WITH ALTERNATING-CURRENT AUXILIARIES
(Other than Navy and Coast Guard)

Item No.	Total number	Name or class	Year	Type	Displacement, tons	SHP (single or twin)	Type propulsion	Auxiliary generators	
								No. and rating	Drive
1	1	*Chestnut Hill*	1918	Tanker	10,800	2400 S	Geared-turbine	2—100 kva 230 v a-c	Geared-turbine
2	4	*LaBrea*	1919	Tanker			Geared-turbine	2—200 kw a-c	Geared-turbine
3	2	*Daniel Webster*	1919	Cargo	17,000	3000 S	Geared-turbine	2—100 kw 230 v a-c	Geared-turbine
4	4	*J. L. Luckenbach*	1923	Cargo	11,953	5000 T	Geared-turbine	2—250 kw 220 v a-c	Geared-turbine
5	1	*T. W. Robinson*	1925	Bulk cargo	About 18,000	3000 S	Turbine a-c electric	1—250 kw 120/240 v d-c 1—120/240 v d-c	Synchronous motors Geared-turbine
6	1	*Carl D. Bradley*	1927	Bulk cargo	24,000	4200 S	Turbine a-c electric	1—250 kw 120/240 v d-c 1—520 kva 220 v a-c	Synchronous motor and turbine
7	2	*City of Saginaw*	1929	Car ferry	8,000	7200 T	Turbine a-c electric	120/240 v d-c	Synchronous motor and turbine
8	4	*Seatrain Havana*	1932	Car ferry	16,460	8000 S	Geared-turbine	2—250 kva 240 v a-c	Geared-turbine
9	1	*Wuppertal* Hamburg American)	1937	Cargo	498 ft long	6800 S	Diesel a-c elecrric	380 v a-c 2—120 kw 3—a-c/d-c M-G sets 2—a-c/d-c light M-G sets	Diesel Motor Motor
10	1	*Patria* (Hamburg-South American)	1938	Passenger-cargo	20,100	15,000 S	Diesel a-c electric	380 v a-c 2—150 kw 3—a-c/d-c M-G sets	Diesel Motor
11	9	*J. W. Van Dyke*	1938	Tanker	23,900	5000 S	Turbine a-c electric	2—350 kw 440 v a-c 20 kw 120 v d-c	Synchronous motor and turbine
12	36	*Cimarron*-Platte	1939	Tanker	24,800	13,500 T	Geared-turbine	2—400 kw 230 v a-c	Geared-turbine
13	488	M. C. class T2-SE-A1	1942-1945	Tanker	21,880	6600 S	Turbine a-c electric	2—400 kw 450 v a-c 75 or 110 kw 120 v d-c Tandem	Geared-turbine
14	44	M. C. class T2-SE-A2	1942-1945	Tanker	21,880	9900 S	Turbine a-c electric	2—400 kw 450 v a-c 75 kw 120 v d-c Tandem	Geared-turbine
15	10	M. C. class P2-SE2-R1	1944	8 troopships 2 passenger vessels	22,575	18,000 T	Turbine a-c electric	4—500 kw 450 v a-c 200 kw 240 v d-c Tandem	Geared-turbine
16	64	M. C. class S4-SE2-BE1 and BD1	1944	Troopships	6,900	6600 T	Turbine a-c electric	2—250 kw 450 v a-c 2—100 kw 120/240 v d-c	Geared-turbine Geared-turbine

ices of small capacity where the special characteristics of direct current are vital.

(4) For ships having cargo winches, it is necessary, for the present, to provide direct current generators. When the total winch load is a major fraction of the capacity of the electric plant, the whole system should be direct current, for simplicity and low cost. When this winch load is a small fraction of the total electric plant, as on passenger-cargo vessels, it usually will be advantageous to provide a combination system in which direct current is supplied to the winches and other selected applications and alternating current to the remainder of the equipment; and the advantage will increase rapidly as the total capacity of the electric plant increases.

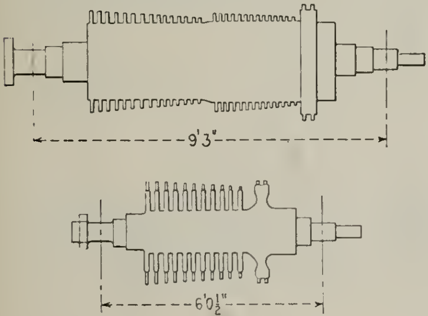
The field for application of alternating current systems will be extended greatly if and when satisfactory alternating current winch drives are available.

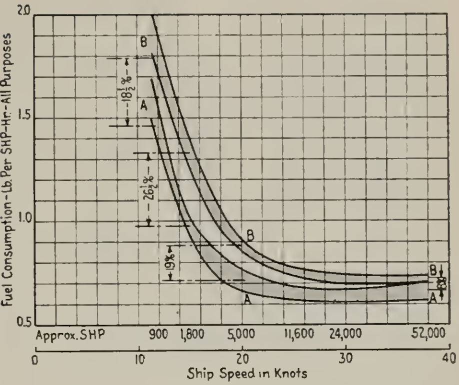
Development of Propulsion Turbines For Combatant Ships

By G. B. Warren

A designing engineer, of the Turbine-Generator Engineering Division, General Electric Co. Mr. Warren, since 1921, has been very actively engaged in the improvement of steam turbines. He relates in this paper the development of marine propulsion steam turbines for the U. S. Navy, beginning with the first excursion of the Navy into higher pressure and temperature ranges and ending with the present Navy standard of 600 psi and 825° F boiler drum gage. These turbine designs have become so standardized that 95 per cent of the U. S. Navy combatant ships produced in the past four years are served by turbines in only four ratings, i.e., 25,000, 30,000, 37,500, and 53,000 shp per propeller shaft. A very high degree of standardization and interchangeability exists between the various parts of the two smaller ratings.

Fig. 1. Reduction of bearing span and dimensions of the high-pressure turbine as compared to older turbine designs with single-reduction gearing.

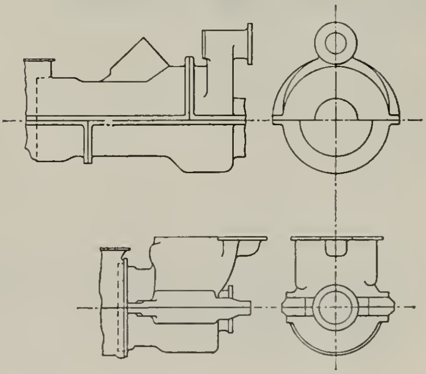


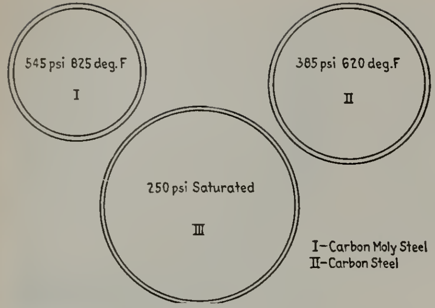


Composite of fuel rate curves on DD-364 and DD-381 Classes, AAA, and those on previous ships with single-reduction gear cross-compound turbines of older design, BBB.

One experimental plant of two cross-compound turbines operating at 1200 psi and 900° F boiler drum, installed on the old destroyer Dahlgren has had several years of successful operation and indicates that these steam conditions are practicable for the Navy. All the operating functions and the details of design are covered in the paper. The author concludes: "It is quite possible that appreciable gains can be made in overall operating economy by even greater attention to the arrangement of auxiliaries" especially in the "split plant" where each boiler room and turbine room are isolated from each

Fig. 2. Reduction in high-pressure casing size as compared to older turbine designs with single-reduction gearing.





Comparisons between piping for different steam conditions. Cross-sections of steam piping for higher and lower steam conditions at the same overall power.

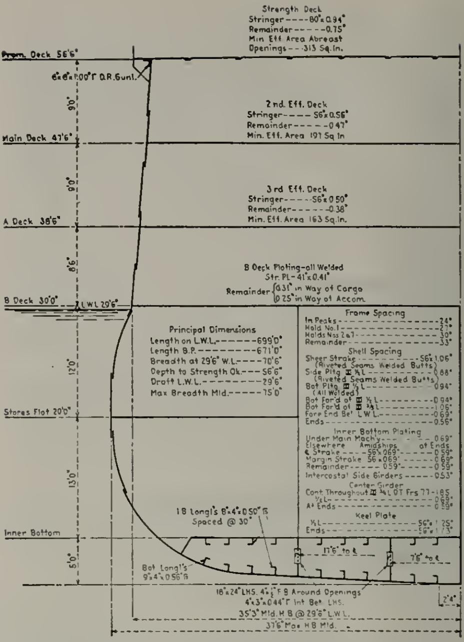
other but operate together. "Under these conditions at low propeller powers the steam turbine driven auxiliaries are operating very much under loaded and hence very inefficiently." This may indicate a greater use of electric drive at cruising speeds. Also "studies are being made as to a possible reduction in overall weight by increasing the condenser back pressure from 1¼ psi absolute to 2 or 2½ psi absolute."

"The steam turbine power plant, together with its associated equipment, has been carried to a high degree of development in the equipment described in the preceding paragraphs. It is reliable, light in weight, economical, relatively easy to manufacture and probably more flexible in operation than any other power plant which has been developed. This does not mean that it has reached the end of its development. It still lacks much in simplicity, economy and lightness of weight. Progress being made in metallurgy and in competitive power plants will aid, stimulate and supplement the development of the steam power plant. It is difficult indeed to foresee all that the future may hold in its further evolution."

Aspects of Large Passenger Liner Design

By James L. Bates and Ivan J. Wanless

These authors are respectively: Director of the Technical Division; and Chief of Preliminary Design, U. S. Maritime Commission.

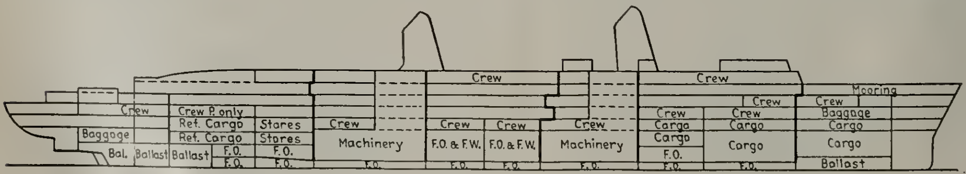


A midship section of Maritime Commission's proposed design P3-S2-DAI.

The paper represents a tremendous amount of work and undoubtedly will be of considerable use to many naval architects.

It compares the general characteristics, machinery, installations, interior arrangement, structural design, subdivision, stability, crew accommodations, and many other details of four European vessels, two American vessels, and one proposed American design: the German liner, Europa; the French liner, Normandie; the Italian liners Rex and Conte di Savoia; American liners, Manhattan and America; and Maritime Commission proposed design P3-S2-DA1. One wonders why the Queens Mary and Elizabeth are omitted.

The comparisons result in a vindication of the



Profile of the America.

GENERAL CHARACTERISTICS

	Europa	*Manhattan*	*Conte di Savoia*	*Rex*	*Normandie*	*America*	*P3-S2-DA1 projected*
Year built	1930	1932	1932	1932	1935	1940	1949
Length overall	936′-9″	705′-3″	814′-8″	880′-0″	1029′-4″	723′-0″	731′-6″
Length between perpendiculars	888′-2″	666′-0″	778′-9″	817′-3″	962′-0″	660′-6¾″	671′-0″
Beam molded	101′-8½″	86′-0″	95′9″	96′-9″	117′-9″	93′-3″	70′-6″
Depth strength deck	79′-4¾″	75′-0″	79′-10½″	79′-9″	91′-10″	73′-5″	56′-6″
Depth bulkhead deck	45′-7¼″	47′-0″	45′-1½″	43′-11″	54′-1⅝″	45′-5½″	38′-6″
Draft molded	33′-6″	30′-6″	30′-6″	33′-0″	36′-7″	32′-6″	29′-6″
Displacement, tons	55,500	33,250	40,000	45,800	68,350	35,440	23,500
Designed speed	27	20	26¼	27	29½	22	27
Designed shp	105,000	30,000	100,000	120,000	160,000	34,000	60,500
No. of passengers,							
First	800	567	500	408	864	543	470
Second	500	......	366	358	......	......	......
Tourist	200	461	412	410	654	418	......
Third	600	196	922	866	454	241	80
Total	2100	1224	2200	2042	1972	1202	550
Cubic capacity for cargo, cu ft	35,880	421,000	72,000	106,700	133,300	300,000	235,000

thesis that American standards of construction and equipment have resulted in the safest ships afloat. "Because of this, it is our hope that the basic facts contained herein will receive sufficient publicity so that all of the traveling public is informed of the conditions as they have existed, with particular emphasis on the defects where construction has not been in accordance with the practices advocated herein. Finally, we believe that improvements dealing with increased safety should be regulated on an international basis so that not only those traveling on American vessels have the benefits of safe transport but that operators will be permitted to reduce expenses by recognition, through the insurance societies, of the value of the safeguards involved."

MACHINERY DATA

	Europa 1930	*Manhattan* 1932	*Conte di Savoia* 1932	*Normandie* 1936	*America* 1941	*P3-S2-DA1 projected* 1949
Shp	105,000	30,000	100,000	160,000	34,000	60,500
No. shafts	4	2	4	4	2	2
Main boilers	24	6	10	29	6	4
Pressure, psi	330	400	450	400	425	850
Temperature, deg F	700	670	725	662	725	900
Auxiliary boilers	None	None	3	4	None	None
Type			Scotch	Scotch		
Pressure, psi			180 sat.	145 sat.		
Generators	4	4	6	6	4	4
Rating	500 kw	500 kw	850 kw	2200 kw	600 kw	1250 kw
Type	Diesel	Turbo.	4-Turbo, 2-Diesel	Turbo.	Turbo.	Turbo.
Emergency generators	2	1	2	2	1	1
Rating	100 kw	75 kw	100 kw	150 kw	150 kw	150 kw
Circulators	Steam engine	Scoops	Turbine	Motor	Scoops	Scoops
per condenser	35,000 gpm	18,000 gpm pumps	26,000 gpm	2-28,000 gpm	18,000 gpm pumps	29,000 gpm pumps
Fire pumps	1-motor driven	2-motor driven	2-motor driven	3-motor driven	2-motor driven	4-motor driven
	880 gpm 2-steam 880 gpm	400 gpm 1-steam 400 gpm	800 gpm	1200 gpm	500 gpm 1-steam 500 gpm	400 gpm
Total	2640	1200	1600	3600	1500	1600
Flooding pumps						
Bilge	6-steam 530 gpm 2-submersible	1-motor driven 500 gpm 2-motor driven	1 submersible 600 gpm	3-motor-driven 1200 gpm 1-submersible	1-submersible 900 gpm 1-motor driven	2-submersible 1050 gpm
	220 gpm	475 gpm 1-steam 400 gpm		1200 gpm	900 gpm 2-steam 450 gpm	
Ballast	2-steam	2-motor driven	4-motor driven	2-motor driven	1-motor driven	3-motor driven
	1100 gpm	475 gpm	1000 gpm	2000 gpm	300 gpm 2-steam 450 gpm	1050 gpm
Total capacity	5820	2800	4600	8800	3900	5250

A Pattern for Research in Naval Architecture

By Commander E. A. Wright

"This paper considers scientific research in the fields intimately related to naval architecture. The text develops around four principal points represented by the following key words:

I. The Projects	Basic
II. The Procedure	Systematic
III. The Facilities	Functional
"IV. The Personnel	Scientific"

Its author now at Charleston Naval Shipyard was formerly Deputy Technical Director, Hydro-mechanics Division, David W. Taylor Model Basin, Washington, D. C.

In the United States basic research in naval architecture is "continually deferred" because the model basins equipped to make such research are kept busy on "conventional tests of immediate importance." Ship designers "as yet have no clear plan, no general organization for basic research." The demands of the future indicate that "merchant shipbuilding should take its place alongside of naval construction as a partner in basic research to keep our nation foremost on the seas."

Europe just prior to World War II had nine model basin establishments "actively engaged in self-propelled tests on ship models"; Japan had 3; United States had one operated by the Navy.

The author recommends the following projects:

A. Extend cooperative research on plasticity in steel and strain in ship structures.

B. Observe the dynamic loads imposed by Nature on ships at sea, and the response to these loads.

C. Study the mechanics of boundary layers, gravity waves, and potential flow patterns around moving in a water surface and immediately below it.

D. Intensify research on the resistance, propulsion, seagoing qualities, maneuverability, route stability, and control of high-speed surface and subsurface bodies.

E. Investigate comprehensively propeller—excited vibration, and all possible forms of propulsion in water.

F. Initiate basic research on cavitation, compression waves, bubbles and vorticity in water.

Development of Ice Breaking Vessels For U. S. Coast Guard

By Rear Admiral Harvey F. Johnson, U.S.C.G. (Retired)

This is one of those monumental papers. It presents in very compact form the history of the development of the ice-breaking art and the fundamental ideas of hull design and power requirements for vessels devoted to that purpose. It was written (to use the words of the author) in the hope "that the material presented—will stimulate interest in the design of ice-breaking vessels, to the end that ice-breaking characteristics will be incorporated, at least moderately, in certain vessels that operate in areas subject to ice, so that they may proceed unassisted when occasion demands."

The text and the illustrations of this paper would furnish any competent naval architect with the basic ideas and fundamental data to fulfill this hope. The author was for many years Engineer-in-Chief of the U. S. Coast Guard.

FLEET OF TUGBOATS CHURN THE WATERS OF NEW YORK HARBOR AS THEY BERTH THE QUEEN ELIZABETH, WORLD'S LARGEST PASSENGER LINER.

Selection of Marine Diesel Drives

By SAUL BELILOVE, Enterprise Engine & Foundry Company

SELECTION OF SUITABLE DRIVE for sea-going vessels demands consideration of the following characteristics:

Reliability
Fuel economy
Overall initial cost
Maintenance cost
Torsional vibrations
Noise
Required skill of operating personnel
Variable torque conversion
Weight
Size
Flexibility of installation
Maneuverability

It is unlikely that any two ship operators would rank the aforementioned factors in the same order. Even for a given type of operation, and where operations differ, other variables are encountered.

First cost of machinery is important from an investment standpoint, but plays an inferior role in operating costs. Fuel costs are far more important. Analysis of machinery operating cost, made for a tramp motorship, operating 250 days per year, is as follows:

	Per cent of total cost
Fuel at sea	51
Engine-room crew—food and wages	24
Repairs	10
Fuel in port	2
Freight of machinery	4
First cost	9
Total	100

Diesels are used because of their thermal efficiency which is the highest of any heat engine that we have yet developed.

Also diesel unit efficiency remains fairly high for small as well as large engines. Thus, in competing with the steam engine in smaller size and smaller powered vessels, a simple compact diesel engine can be used.

Again diesels are used because their maintenance cost has been reasonable. Both maintenance costs and reliability have been improving consistently year after year. The fact is that the modern diesel engines are extremely reasonable in both these respects, and are improving.

Direct Drive

The predominant application of engines having large horsepower is the direct drive. Direct-drive engines, operating at low speeds, enjoy low specific fuel consumptions. These engines are reliable, quiet and have low maximum firing pressures and wear rates. The installation is simple, straightforward, easy to inspect and easy to operate; and, the developments of diesel engine design over the past few years has affected considerably and favorably the use of engines connected directly to the propeller.

Increase in allowable loading, accomplished by the turbo-charging of four-stroke diesels and more effective scavenging and supercharging of two-stroke cycle diesels, has increased the direct-connected engine's competitive position. These advances have enabled engines identical in size to ones in previous use, to deliver more than previous ratings. Since the speed does not increase, these greater horsepowers can be used without sacrificing propeller efficiency.

However, the direct-drive engine is large in size (detracting from payload space and adversely influencing vessel design), heavy (detracting from payload displacement), expensive and cumbersome to install and maintain. It is inflexible from the standpoint of adjustment to the various operating conditions of the vessel, and, in some instances, neither offers the necessarily wide speed range required nor the speed of maneuvering that is desired.

Modern diesel engines have been improved to the point where they operate reliably at much higher speeds than did their ten-year-old brothers. Greater general design experience; greater precision in production; new and better functions for lubricating oils; new and better materials for valves, pistons and bearings; precision, localized hardening techniques; surface treatments of liners,

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[*] Presented before the Northern California Section of the Society of Naval Architects & Marine Engineers, November 7, 1946.

rings and pistons; better piston cooling—all these have contributed to this development.

The Geared Drive

The reduction gear drive has had only indifferent success in the long years since its inception. Although higher-speed engines can be used for geared applications, with a consequent reduction in weight and size and cost of the engine itself, the overall equipment may very well cost the same or more than the direct drive. Gears for heavy equipment of this kind, manufactured in small quantities, have been disproportionately costly.

As engine speeds increase, noise and maximum cylinder pressures become greater, and, despite improved design, wear increases, complexity increases, and overall fuel consumption increases. With slow-speed engines and irregularity of power transmission, hammering of the gears can be expected. Mechanical, torsionally flexible couplings have been an inconsistent remedy.

Diesel-electric Drive

The other marine transmission in appreciable prewar use was the electric drive, using direct current. With this type of drive two or more engine generating units are electrically connected to one or more propulsion motors, which are either directly, or through gears, coupled to the propeller. The diesel generating units can be installed at any convenient point, and the propulsion motors can be located in the after-hold, thus requiring only a minimum amount of shafting. This flexibility of machinery arrangement allows more emphasis to be given to hull efficiency considerations.

Electricity is a flexible medium; thus, diesels generating electricity open up possibilities for using their power for purposes other than propulsion. One possibility is auxiliary service during vessel operation at sea. Another is its use for operating cargo-handling machinery in port.

Direct-current electrical drive can, from the standpoint of operating performance and flexibility, out-perform all other types of marine equipment. Reversing and a complete range of operating speeds from zero to maximum are accomplished electrically, allowing very rapid and smooth action.

In marine propulsion, as the propeller speed decreases, the load on the engine decreases as the square of the speed. For example, at a propeller speed one-half of full speed the load on the engine is only one-quarter of full load; and, the specific fuel consumption has increased appreciably. Therefore a single, direct-drive diesel will operate unfavorably for an appreciable proportion of the time. With multiple power plants, either geared or electric, a portion of the plant may be shut down during low power periods allowing the remainder to deliver the requirements at a relatively high load factor.

Also with electrical direct-current drive the maximum power may be supplied for several different conditions of operation.

Direct-current electric drive, like the geared drive, has the advantages that the equipment is smaller and lighter than the direct drive; can be serviced and installed more conveniently and economically; and can offer greater reliability, the vessel being able to continue operation even when one engine is forced out of commission.

The applications where these advantages are important are not so extensive and the advantages themselves are counterbalanced by serious disadvantages.

Direct-current diesel-electric equipment costs close to 50 per cent above the cost of direct or geared drives.

There is a loss of approximately 15 per cent in the electrical equipment, a major factor in comparing fuel costs. Electrical equipment is large in size and requires special techniques for operation, maintenance, and repair. Controls are extensive and complicated.

Direct-current generating units operate at moderate speeds (500-850 revolutions per minute), so that diesel-electric plants require more room than a geared diesel plant.

There is increased noise, maximum firing pressures and wear.

Direct-current diesel-electric propulsion equipment cannot be used for shipboard auxiliary purposes, because it operates on a variable voltage.

New Developments

The aforementioned types constitute the present basic diesel marine drive. Direct-drive units are far and away the most popular. Engine manufacturers have learned to build praiseworthy reliability into their equipment, and, as a result, there are actually many makes of diesels, of various horsepower ranges, which can offer continuous, reliable, close-to-full-load operation for many days or weeks at a time without respite. With this dependability available, and with the excellent fuel economy of direct-drive units, their continued popularity is understandable. However, new developments are bound to exert pressure from the standpoint of less weight, less space, greater overall vessel reliability, and, possibly, less initial cost.

Alternating Current

One promising new development is the use of alternating current rather than direct current. It is lighter, cheaper, can be run faster and is much more rugged and cheaper to maintain than direct-current equipment. Its efficiency, however, is not much better than direct-current and in maneuverability characteristics it is complicated, slow, and in general, is not even as good as the direct-reversible diesel. Also, it is inflexible from the standpoint of supplying maximum power for various operating conditions, and it cannot vary its torque conversion properties at all. This means that it acts identically as a fixed ratio reduction gear and, where hull resistance changes, the machinery cannot change to suit.

Alternating-current equipment, however, can be useful in multiple generating sets for large powers, in cases where maneuverability and variable torque conversion is not important, and where the overall vessel requirements preclude mechanical coupling of the engines to the propeller. It also can offer large amounts of power in port, without the necessity of special or extra-sized auxiliary units for that purpose alone. However, since the main propulsion equipment is operating on variable frequency its electrical power is not suitable for auxiliary purposes at sea, except for limited periods and particular applications; but one or two of the main generating units could be operated on constant frequency as auxiliary units, thereby effecting a uniformity of major power units on the vessel.

The Bowes Drive

A highly interesting variant of the alternating-current, variable-frequency drive, now attracting attention, is the Bowes Drive, an ingenious electrical device which effectively combines an alternator and a synchronous motor into one piece of equipment. There are three major elements composing the equipment: (1) an engine element with field winding, attached to the engine crankshaft and rotating with it, (2) a doughnut-shaped secondary element outside of the engine element, with windings on both the inner and outer circumferences and mounted on either the propeller or the pinion shaft, and (3) a stationary element, concentric with the other rotating pieces and outside them, with field windings on its inner circumference.

The advantage of this drive is that it transmits a great deal of its torque by reaction exactly as does the electrical coupling. The balance is transmitted electrically just as any alternator-synchronous motor combination. Because some of the power (depending on the gear ratio) is transmitted by reaction, the efficiency is high and actually can be higher than 95 per cent. Also, there is available a design for electrical reversing.

The advantages claimed are: (1) a disconnectable coupling, (2) speed reduction from engine to propeller shaft, (3) elimination of torsional vibrations, (4) electrical reversing, (5) electrical power available at the dock by braking the propeller shaft, and (6) electrical power at sea under certain conditions.

It has, of course, the operating disadvantages of alternating current—no variable torque conversion, and slow electrical maneuvering operation. However, as a single engine, moderate ratio, electrical reduction gear, it is far better than anything else available. For this function, and perhaps with the use of a rectifying unit to obtain a useful auxiliary voltage, it will have applications and should be watched.

The Controllable Pitch Propeller

A further new development which will find popularity for some applications, particularly as a competitor for the variable torque conversion features of the direct current electric drive, is the controllable pitch propeller. A large number of patrol vessels, built during this past war, were equipped with controllable pitch propellers, driven by radial diesel engines, mounted with crankshafts vertical, through a right-angle gear drive.

Advantages are:

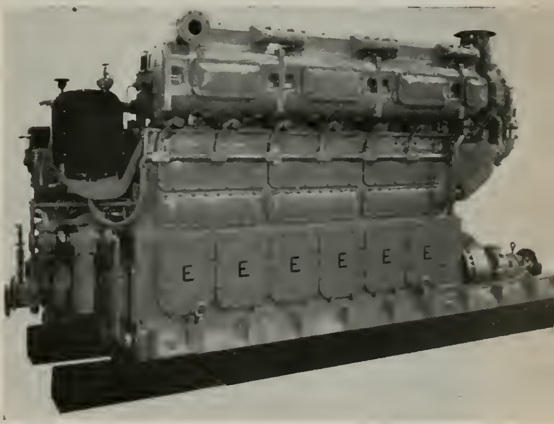
1. Variable torque conversion without loss of efficiency.
2. Reversibility, smoothly and speedily, eliminating the need for the engine reversing mechanism.
3. Smooth speed regulation from full speed to zero.
4. Better adjustment of the engine load factor for all operating conditions.

Hydraulic Drive

One of the most promising power transmission mediums of the future is the hydraulic equipment of the rotary, pump-and-motor combination type. This hydraulic equipment can compete closely in efficiency, weight and size with electrical equipment; has as good, if not better, torque conversion and maneuvering properties; and has the additional attractiveness of being completely mechanical. In cost, too, it should be competitive with marine electrical equipment, particularly since its controls are very simple.

War Developments in Geared Diesels

Even before the war, the problem of gear pounding was brought under control successfully by importations from Europe—electric and hydraulic couplings. A large number of ships have been built in the United States with this equipment during the war. The coupling, either electric or hydraulic, is installed between the engine and the gear and isolates engine speed pulsations from the reduction gear, thus allowing smooth transmission of power; serves as a disconnecting coupling, allowing instantaneous disengagement should one of the engines become disabled; and in the case of towboats allows one



of the engines to run "Ahead" and the other "Astern," which with coupling manipulation, gives excellent maneuvering characteristics.

Couplings add to cost and decrease efficiency (2 to 3 per cent) but they eliminate one of the major problems of geared equipment.

Experience shows that the gears themselves are reliable. It might reasonably be concluded that the geared diesel drive will enjoy an increase in popularity.

Applications to Various Types of Ships

Towboats. The harbor tug requires low propeller speed for maximum thrust at low vessel speeds. Full torque conversion for all types of tows and rapid maneuverability for speeding up the docking operation are definitely desirable. These requirements may best be filled by the direct-current electric drive, although the problems of cost and complication are difficult hurdles. Installation of electrical drives on seagoing tugs, where rapid maneuverability is not often required, is not equally justified.

Ferries. In general, the direct drive, direct reversible diesel has been most popular for ferryboat installations. It is to be expected that this type engine and the geared diesel will continue in popularity. However, for runs where ability to maneuver may be an appreciable factor in overall operating time, direct current diesel electric drive may be useful.

Cargo Vessels. Low fuel consumption and high reliability are the major requirements of the cargo vessel. Low - speed, direct - drive, or multiple, medium - speed, geared diesels answer these requirements.

The major auxiliary load for cargo vessels occurs at the dock during winch operation. Therefore, diesel-electric propulsion machinery, which can handle this auxiliary load at the dock and thereby fill a dual purpose, has an attractive first-glance argument. The penalty, however, of electric propulsion losses at sea, as well as first cost, is a distinct disadvantage.

Furthermore, with tendency for carrying refrigerated cargo and air-conditioning equipment, which can constitute an appreciable sea-load, there is additional reason for separate auxiliary power.

Tankers. The direct drive or geared diesel seems, for the same reasons as for cargo vessels, most suitable for tankers. However, like cargo vessels, tankers need appreciable power at the dock for loading and unloading. Nevertheless, the penalty of electrical propulsion losses and first cost is high.

Dredges, in general, have an appreciable power load besides the main pumps. Cutting equipment, jet pumps and swinging machinery all require appreciable amounts of flexible power. There is good reason, therefore, for careful study of a diesel-electric installation. Indeed, the flexibility required is so great that many installations have used several independent generators driven by a single engine.

When the dredge is self-propelled, there is additional reason for a diesel-electric installation. The power required by the main pumps and the power required for propulsion are both appreciable and, since peak pumping and propulsion loads occur alternately, and practically never simultaneously, one set of prime movers is sufficient for both functions, thereby saving appreciable space and weight.

Yachts. Reliable, light, and compact machinery is required for yachting service. Medium-speed direct-drive or probably geared diesels are particularly applicable for this service.

Ice-Breakers, Survey Boats, Coast Guard Cutters and Salvage Vessels. Electric drive's torque conversion, maneuvering and operating capabilities have particular usefulness in such vessels. The versatility of the direct-current power plant in performing the various assigned duties is an expensive but generally useful feature.

Fishing Trawlers and Seiners. Reliability and simplicity are the dominating requirements for all kinds of fishing vessels.

Since auxiliary loads are periodic and moderate, the use of electric drive appears to have the important advantages of being able to accomplish a dual function. However, the necessity of simplicity and low first cost explains the direct drive's continuing popularity. It is to be expected, however, that geared units will enter the field.

The torque conversion quality of electrical equipment is advantageous when towing nets, thus making electrical equipment desirable for more reason than its ability to supply power to the winches. A careful study may show it sufficiently valuable to warrant an introductory installation.

Technical progress has made available engines which, while operating at much higher speeds, have retained the dominant feature of reliability. This technical progress cannot be ignored. The higher speeds require either the use of indirect drives, or the acceptance of a lower propeller efficiency, at least until further developments are made by the propeller designers.

Although the indirect drive will find more and more consideration in the future, it is hoped that the low fuel consumption and extreme simplicity of the direct drive will be retained to as great a degree as possible.

A logical corollary to low fuel consumption is the use of low-cost fuels. Too much emphasis can hardly be placed on the importance of this single item on the overall cost of power production in many applications. In this connection, choice of engine speeds for indirect drive should take into account the use of low-cost fuels.

Finally, it is suggested that motorship operators give consideration to the establishment of a cost analysis consumer organization similar to the Diesel Engine Users' Association which has operated for many years to the great benefit of stationary plant operators and engine builders. The returns should be well worth the relatively small expenditure required.

Selection of Marine Diesel Drives

Discussion of Preceding Paper

By W. EDGAR MARTIN*

MR. BELILOVE has written an excellent paper on this subject and it should stimulate considerable good thinking amongst those interested in using diesel engines in various forms for marine propulsion.

With particular reference to the diesel electric drive, the author mentions cost as the first disadvantage. I think this should be mentioned as a consideration rather than a disadvantage. This additional cost, which may be as low in some cases as 20 per cent, brings certain advantages which may more than offset it.

The second objection concerns efficiency. On large installations the combined motor and generator efficiency may be as high as 90 per cent for direct current and up to 95 per cent for alternating current. This loss would not be all loss in view of the fact that with the electric drive a much more efficient propeller could be used than with the direct drive. Of course, with geared drive, the low speed propeller efficiency could be maintained and in this case only about 2 per cent loss in the gear would obtain plus the loss in the electric coupling if one were used.

The third disadvantage of diesel electric drive is special technique to operate and maintain it. In the case of direct current which has been used in most cases to date, the motors and generators are no more complicated than the ordinary auxiliary generator with which the chief engineer or electrician on the ship would be familiar. The control ordinarily used on the variable voltage type is equally simple and on installations of the type, operation, maintenance and repair has been very successful and has not required any specialists.

As to diesel electric plants requiring more room than a geared diesel plant, in some instances the propelling motor can be located completely aft and in addition to giving better trim to the vessel, it has made the engine room length in some cases even shorter than geared drive with electric couplings.

Regarding the author's diesel electric disadvantage as to the main propulsion equipment not being used for auxiliary purposes because of variable voltage, this of course would apply to direct current. Some alternating current installations have been made which would permit taking auxiliary power from the main generators. This, however, might be limited in certain applications where constant frequency was necessary. However, on T-2 tankers the cargo pumps are run from the propulsion generator over a range of 45 to 63 cycles.

The author mentions the possibility of conversion of part of the ac current to direct current for winch motors.


W. Edgar Martin of Westinghouse Electric Corp.

It may be of interest to mention here that at least one electrical manufacturer has developed and is installing an alternating current operated winch. As the use of ac deck machinery becomes more prevalent, it may change the picture considerably as to selection of ac or dc equipment both for propulsion and auxiliary power.

We note no mention of using electric drive on tuna clippers. This type of vessel offers a splendid opportunity to apply electric drive successfully. Using alternating current, the main power plant can consist of two or three main diesel generator sets, operation on each being at full load the number of units involved depending upon the speed of the vessel and other auxiliary requirements. The large refrigeration load on this type of vessel makes it particularly desirable to use the same generators for auxiliary power as main propulsion. At times maximum auxiliary load would be required to get temperatures of refrigerator compartments down, after which the power could be utilized to give the vessel maximum speed in coming back to port with a load of fish. Other advantages would seem apparent by use of the main generators in parallel for both propulsion and auxiliary load.

Two large installations of diesel electric drive have proved very successful.

The Navy, in 1942, placed in service a twin screw 12,000 shp vessel using alternating current. Each 6000 hp 140 rpm motor derived its power from four 1150 kw diesel generator sets operating at 750 rpm. The generators operated in parallel and it was found that generators could be added and taken off the main bus quite easily. Speed control through the engines gave a variable frequency system which worked out very well.

A more recent installation is that of some direct current diesel electric ice breakers for the U. S. Coast Guard. An interesting feature of this installation is the bow propeller driven by a 3300 hp dc motor. Twin screw astern motors are each 5000 shp. Six generator sets supply the power.

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*Mr. Martin was invited to comment on the preceding paper following its presentation before the Northern California Section, Naval Architects & Marine Engineers.

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

1947 Outlook for World Trade

By ALVIN C. EICHHOLZ, Manager World Trade Dept., San Francisco Chamber of Commerce

Alvin Eichholz

THE COMING YEAR will probably again see a large volume of exports from the United States and also for the Pacific Coast. The favorable factors that have been responsible for the ten billion dollar volume of exports during 1946, continue operative, namely, supplies of exchange are still available in many countries in considerable volume, the pentup demand for most products still exists. American manufacturers and exporters and those of other countries have not been supplying the needs of the foreign countries as rapidly as was expected early in 1946 or as was hoped for by the importers in foreign countries. Furthermore, a number of the countries, especially in Europe, that were not export markets in 1946, have made remarkable recovery and will be important purchasers during 1947.

However, the year 1947 will probably be the most crucial year in the history of American foreign trade in so far as the long term picture is concerned. During 1947 we will mold America's foreign commercial policy which will determine the volume of our foreign trade for many years to come. Early in the year, our government will carry on negotiations first with 18 specific countries for the conclusion of new broad reciprocal trade agreements, which will obtain further reductions in tariffs, removal of trade barriers, enlargement of quotas, and non-discriminatory treatment on granting of exchange that will mean opening new markets and enlarging old ones. Later on in the year, further negotiations with a larger group of countries should make further advances in unclogging the channels of world trade for all countries. Secondly, there will be carried on the important meetings to perfect the International Trade Organization.

The preliminary meeting held in London at the end of 1946 was productive of encouraging results. Matters which appeared to be major stumbling blocks were quickly adjusted and there was general agreement by all delegates on all of the important topics designed to reconcile the divergent commercial policies. Furthermore, the expected tendencies toward nationalism with consequent protective tariff systems on the part of a number of countries failed to materialize to any great extent. A second preliminary meeting with a larger number of countries will be held about the middle of the year. In the early fall it is anticipated to hold a meeting of all of the United Nations with a view to perfecting the structure of the international trade organization. If these meetings are successful in accomplishing the objectives desired, then the United States and the countries of the world will have created a favorable economic climate in which world trade and world employment can expand. The World Bank and the International Monetary Fund, which began to function toward the end of the year, will make their contributions toward stabilizing currencies and economic conditions in the various war-torn countries. Should the reciprocal trade agreement negotiations and the efforts to perfect the international trade organization prove unsuccessful, then 1947 may well be a fateful year for the future of American foreign trade.

Imports

In these major efforts being made by our government to make possible a greater volume of world trade, American industry, agriculture, producers, exporters and importers must view with a different attitude the importance of imports in the future of American life. With the world poor in financial resources and exchange, the only certain way of assuring the establishment of export markets expanding for the years ahead is the development of a larger volume of imports into the United States. The two projects referred to above are fundamental to increasing our imports.

It is little realized that the United States normally is the best customer for nearly one hundred foreign countries. If we are to anticipate re-establishment of their economies, we must think in terms of increasing our purchases from them. Our purchases from overseas will be large when our economy at home is operating on a full capacity basis. Thus, it is evident that a prosperous United States is the greatest assurance for larger markets for the products of other countries.

Not only must we think in terms of increasing our purchases of various raw materials from other countries, but we must consider purchases of greater quantities of their manufactures. It is through larger purchases of manufactured items that greater employment openings will be supplied in foreign countries, their standards of living re-established, and the purchasing power provided to pay for American manufactures export. We cannot continue to make loans to countries to pay for our exports. We should have learned a good lesson from this practice after World War I.

Credits

Extensions of credits and loans should and will be made for the purpose of reconstruction and rehabilitation, with a view to restoring markets that existed prior to World War II. However, the most satisfactory way of assisting foreign countries re-establish their economies is for us to increase our purchases from them. It is generally believed that this can be done without harm to our existing industry and agriculture.

Asia

We should now consider a review of the regional situations and their bearing upon the possible volume of 1947 trade. In the Pacific Area, we find various conditions, some favorable, some unfavorable. The boom purchases of China and the Philippine Islands were to be expected in view of the shortages of products and the tremendous volume of dollars available with which to pay. The saturation point has been reached for many consumer items, and the volume of these will decline considerably. Basic conditions in the Philippine Islands are now reaching a point where their economy will settle down and as industry and business are re-established their purchases will take the form of building materials, machinery, tools and equipment rather than consumer goods. The progress made thus far in restoring Philippine production and export of native products is most encouraging for the future.

The Chinese situation is more confused than ever at the turn of the year, and it is quite apparent that the boom proportions of the Chinese market so widely heralded may not develop for years. A great deal needs to be done by China herself to establish political unity, and carry out needed financial reforms and reorganization. China's new customs regulations have already precluded large shipments of luxury products and consumer goods in view of the developing shortage of exchange. We may hope for, although there is no assurance of, early efforts to settle the confused currency and exchange situation. Progress, however, will be made although at a slower rate on some of the basic projects for the restoration of China's transportation and communication facilities, industries and other business enterprises. Recent word from our State Department is that private business will not open in Japan until toward the end of 1947. However, there is some hope that this may take place earlier.

In Southeastern Asia there is some encouragement regarding the situation with the formation of the Netherlands-Indonesian Union, which should bring about a solution of the political differences there. Good progress politically and otherwise is being made in Siam and British Malaya and we can anticipate some business with these regions during 1947. The French Indo-China situation still needs solution. Already there are some encouraging developments with regard to Australia, New Zealand, British India, British Malaya and Hong Kong. The availability of exchange in these territories should improve steadily, and by September, on the anniversary of the approval of the British loan, we can look for steps to be taken to dissolve the sterling pool and modify imperial preference.

Latin America

Looking now at Latin America, we are overlooking substantial opportunities there in the failure of our manufacturers and exporters to seriously study these markets and meet their specific requirements and conditions. All of these countries still have large stocks of exchange and they are protecting these by regulations in order to conserve them for the purchase of machinery, tools, equipment and industrial materials in order that they can further their efforts toward industrialization. Our manufacturers of all goods and materials, other than consumer goods, should lose no further time in getting their prod-

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ucts introduced in Latin American countries. The greatest assurance to expanding Latin American purchases in the United States is for us to increase our purchases from them.

Europe

Looking at the European market, we can find a number of specific signs there which are particularly encouraging to the Pacific Coast. With our impending large agricultural and food production, the Pacific Coast States will need foreign markets commencing in 1947 more than ever in their history. The current interest on the part of a number of European countries now being shown in dried fruits and other foodstuffs, which augurs well for the future. Particularly noteworthy in the restoration of the European markets for our foodstuffs is the rehabilitation work done in the past year in Norway, the Netherlands and Belgium all of which are showing new interest in West Coast foodstuffs. France has not made the progress in rehabilitation expected of her, but she will become an increasingly important factor in Western food business. Increases in quantities and numbers of the British import token list, has permitted the importation of large quantities of foodstuffs. This seems to indicate a steady improvement of basic conditions that may well mean larger British purchases of West Coast foodstuffs. Of course, Sweden and Switzerland, which suffered little from the war, will continue to enjoy a good business and should both increase their purchases from the West Coast. These countries along with the Low Countries expect to increase their sales to us during 1947.

The Central European situation is not very encouraging and will be dependent upon the conclusion of the peace treaties and other factors. The business people in several of these countries, notably Poland, Czechoslovakia and some of the Balkans are anxious to get their commerce restored, but political and other factors are holding up these developments.

U. S. Industries

Our manufacturers must lose no further time in considering their policy regarding exports. Our most important manufacturing industries such as automative, industrial machinery, agricultural machinery, electrical equipment and apparatus, machine tools and so forth, will find themselves, possibly before the middle of the year faced with the fact that they have supplied a major part of the backlog of the domestic market demand and will have to develop foreign markets to enable them to keep up their volume of production. We believe that at the turn of this year all manufacturers should review their company policies with regard to their participation in exports. More and more, those now endeavoring to enter foreign markets are finding that manufacturers and exporters of other countries are getting well established in the Latin American and Far Eastern markets particularly, and by the end of 1947, they may find highly competitive conditions in most foreign markets for their products.

Shipping

1947 may well be a year in which shippers and the shipping industry could work closer together to further the interests of the American Merchant Marine and American import and export trade. It is not the volume of our commerce in 1947 that concerns us so much as what the years after hold for us as a trading and shipping nation. We must shape the pattern in 1947 so that the future will be assured.

A Time to Remember

Eleven clocks salvaged from ships sunk or damaged at Pearl Harbor during the infamous attack were displayed in the Fifth Avenue window of The Mosler Safe Company by the War Assets Administration and the Navy as a feature of the 1946 observance of Pearl Harbor Day. The ships from which the clocks were taken were the battleships Colorado, Tennessee, Maryland and Arizona, the destroyer Badger, the destroyer transport Manley, the submarine Nautilus, the tanker Boholink, the submarine tender Holland and the Santee.

International Postal Money Order Service Renewed to Certain Countries

The U. S. Postal Bulletin for December 3, 1946, announced the renewal of international postal money order service with a number of foreign countries, the service having been discontinued during the war. These countries are Belgium, Czechoslovakia, Finland, France, Greece, Hungary, Luxembourg, and Yugoslavia, as well as with the places for which they act as intermediary. Other places and countries to which money orders can again be sent through the intermediary of other countries are Gibraltar, British Somaliland, the Azores, Madeira, Mozambique, and Angola, but they cannot now be sent to Borneo, Burma, and the Channel Islands.

Money-order service with the British Solomon Islands is conducted through the intermediary of New South Wales, but the only post office at which United States international money orders can be paid there now is Haniara, Guadalcanal. At the present time there is no provision for the payment of orders in Istria.

The countries with which the United States has an exchange of money orders at the present time on the international basis are the following:

- Argentina.
- Australia (Commonwealth of) consisting of—
  - New South Wales.
  - Queensland.
  - South Australia.
  - Tasmania.
  - Victoria.
  - Western Ausrralia.
- Belgium.
- Brazil.
- Chile.
- Colombia.
- Costa Rica.
- Czechoslovakia.
- Finland.
- France.
- Great Britain and Northern Ireland.
- Greece.
- Guatemala.
- Honduras.
- Hungary.
- Iceland.
- Ireland (Eire).
- Lebanon.
- Luxembourg.
- Mexico.
- New Zealand.
- Palestine.
- Peru.
- Salvador.
- Surinam.
- Syria.
- Union of South Africa consisting of—
  - Cape of Good Hope.
  - Natal and Zululand.
  - Orange Free State.
  - The Transvaal.
- Uruguay.
- Yugoslavia.

The maximum amount for which a single money order may be drawn is $100, but more than one order for that amount can be purchased on the same day. However, the limit for a single order payable in Honduras is $10, and only one order for that amount may be purchased on any one day by one remitter in favor of the same payee.

S. F. Foreign Trade Association Elects 1947 Officers

Fred B. Galbreath, manager, Pacific Department, Marine Office of America, has been elected 1947 president of the Foreign Trade Association of the San Francisco Chamber of Commerce.

W. B. Gribble, assistant manager, Export Department, W. P. Fuller and Company, is first vice president; W. J. Gilstrap, assistant vice president, Wells Fargo Bank & Union Trust Company, is second vice president; and G. A. Gumbrecht, resident partner, Henry W. Peabody & Company of California, is third vice president.

Fred B. Galbreath, manager, Pacific Department, Marine Office of America.

Treasurer for the coming year is J. S. Curran, vice president, Anglo California National Bank of San Francisco, while Alvin C. Eichholz, manager World Trade Department, San Francisco Chamber of Commerce, is re-named secretary.

Elected to the Board of Directors are: Ralph V. Dewey, Harry C. Dunlap, B. S. Fong, James C. Morrison, Daniel Polak, J. H. Rogers, Austin H. Roy, David Mann Taylor and Richard S. Turner. Directors re-elected include: Frank Cook, A. Gemperle, R. H. Kahman, E. Russell Lutz, H. A. Magnuson, George H. Mahoney, M. J. McCarthy, R. J. Roesling and Harry R. Sims.

New Officers for Oakland Foreign Trade Club

At the December meeting of the Oakland Foreign Trade and Harbor Club, the following officers and directors were elected to serve for the 1947 year: President, M. D. McCarl of the Port of Oakland; Vice President, Wallace B. Worswick of Galen Company; Treasurer, Frank McCarthy of Central Bank; and Secretary, Lyford M. Morris of the Oakland Chamber of Commerce. Two new directors were elected to serve for two years on the Board of Directors; they are, Richard H. Steuben of Cutter Laboratories, and William J. Gleason of Kaiser Export Division.

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Promoting World Trade Through Education

By E. GEORGE DAVIS

MUCH OF THE BUSINESS of San Francisco has to do with international commerce, which includes shipping, aviation, importing, exporting, marine insurance, communications, advertising, banking and other activities. It has been estimated that one-third of the business of a community like Metropolitan San Francisco is either directly or indirectly connected with the international exchange of goods and services.


E. George Davis

While the various colleges and universities of the Bay Region have for many years included many courses of study in such subjects as international economics, political science, history, and foreign languages, very little importance has been given to foreign commerce as a specialized field of study. This has been due, in part, to the fact that before the war, many business firms preferred high school graduates to college-trained men. Although this was not the case in the East, it was as far as the West is concerned. There are several universities in the East that have colleges of foreign service or foreign commerce affiliated with them, which has provided the larger eastern firms with men who are adequately trained to handle the many different activities that have to do with international commerce. As a matter of fact, many of the executives of different companies engaged in world trade in the west received their college training in an eastern university.

In the Bay Region, there are several specialized colleges in law, medicine, dentistry and teachers' training. But in spite of the fact that world trade is the most important activity in this community, we do not have a specialized college of world trade, which would provide the many firms engaged in that type of endeavor with the kind of trained personnel that is required for their local offices and foreign branches.

As a result of the war, there has been a substantial increase in population in the San Francisco Bay area. The San Francisco Chamber of Commerce states that in 1940 the total population of the Bay Region was 1,734,308, while in 1946 it was 2,543,100, or an increase of about 45 per cent. As a result of this increase in population, augmented by four years' accumulated demand for college training by returned service men, all of the educational facilities of the Bay Area, including those of higher learning, are overtaxed. For instance, the University of California in Berkeley has an enrollment this semester of 22,000 students, which is twice the number that the campus is supposed to handle. Other local colleges and universities are experiencing the same thing, which is another reason why a College of World Business in downtown San Francisco would be most desirable for the present and future.

The proposed San Francisco College of World Business would be a regular day time school, open to students who have completed two years of undergraduate work in an American college or university or have the equivalent academic background from a foreign university. It would be a three-year course, with the last year being supplemented by a certain amount of on-the-job training, or interneship, in the offices of local steamship companies, airlines, foreign departments of banks, freight-forwarding offices, travel agencies, import-export houses, communication companies, or marine insurance agencies. After having successfully completed three years of training, the graduates would receive a degree, say of Bachelor of Science in World Business.

In addition to the American students in attendance, encouragement would be given to the training of foreign students, particularly from the countries of the Far East, South Pacific and Latin America, who might come here on scholarships to learn American business methods. During the war many students of engineering were brought to this country from the Far East and Latin America under the auspices of the International Training Administration, to learn something about United States production and transportation methods. Here in San Francisco we played host to a large number of Chinese students who were returning to China. Such a school as this proposed College of World Business would be an opportunity for business firms to promote their foreign business by awarding scholarships to foreign students of business, who might be the sons or nephews of men with whom they do business abroad.

As time goes on, it will be possible to arrange orientation classes for these foreign students in their own language. In addition to giving certain training to these foreign students in their own languages, these classes would provide an opportunity for English-speaking students who are desirous of perfecting their existing knowledge of the particular foreign language, to hear lectures in those languages.

Also, in addition to those activities related to the importing and exporting of merchandise, there are many other activities in the field of world business, all of which will be more and more important to San Francisco. Overseas advertising, tourist travel, foreign investment, and newspaper reporting are a few examples. The government is now recruiting people trained in civil affairs, information and publicity or agriculture, for foreign assignments in Europe and the Far East.

A college such as this could serve a very useful purpose, in supplementing existing educational facilities, in training men for service with agencies of the United States Government, the United Nations organization or even for specialized service for foreign governments. The writer, for instance, has worked for two Latin American governments.

Alvin C. Eichholz, in his booklet "Opportunities for Employment in World Trade and Foreign Service," says that in many instances, an individual with special industrial, technical or professional knowledge can take a limited number of courses in the field of international relations to acquire special knowledge of the country or region to which he plans to go. The application of his special knowledge in the terms of a new race, a different language and a different environment may be an important factor in assuring his success.

Photo by Tommy Weber

Granville Woodard, newly appointed Director of Trade Policy, Far East-America Council of Commerce and Industry (formerly the China-America Council). Mr. Woodard served for more than twenty years as an expert on the Far East in the United States Departments of Commerce and State.

Before the war, many complaints were heard from students of local colleges to the effect that the courses offered in world trade were too theoretical. The following were some of the complaints that were heard from business men: Students graduating from our local universities are incapable, due to the inadequacies of their college training, to assume greater responsibilities in a business office than high school graduates; many of them know nothing of salesmanship and a large percentage cannot write a good business letter in the English language, let alone in a foreign language, as far as knowing the mechanics of the foreign department of a bank, the import section of a department store, or the traffic department of a steamship company are concerned; college graduates usually did not possess any more ability than high school graduates and therefore, as far as employers were concerned, were not worth any more money.

These complaints were largely justified, because heretofore, the local universities had not felt that the need for more practical "down-to-earth" training in the field of world business was in sufficient demand. The war has brought about a changed attitude in this regard, due

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primarily to the fact that so many veterans now going to college seem to be interested in how they can earn a living *quickly,* while at the same time, employers, instead of seeking untrained people who will require several years of close supervision, prefer people to whom they can delegate responsibility within a comparatively short period of time.

While a certain amount of knowledge of such subjects as philosophy, psychology, literature and mathematics is entirely desirable, and a person going into foreign service, either for the government or a private firm, should have a background of economics, political science and history, a college training program can be so balanced that a student can complete all of the different courses he will require to earn a living, while at the same time have enough cultural background to give him that personality he should have to make a good impression on people with whom he comes in contact, either at home or abroad.

Experience has shown that practical men oftentimes make very good instructors of the subjects in which they specialize. As a result of the World Trade Institute, which was held in San Francisco during the early part of last year, hundreds of favorable comments have been heard. At that Institute all of the speakers and members of the panels were practical men in business or government service. As a result of that conference, night classes in foreign trade subjects were started at the University of California Extension and the results have been very satisfactory.

Therefore, by having the proposed College of World Business located in downtown San Francisco, moving to the World Trade Center when that most worthwhile project is completed, teaching talents can be drawn from the offices of the import-export houses, banks and shipping companies. Many executives of foreign trade organizations or similar types of firms, in addition to knowing their own specialized field, have university degrees and happen to have teaching talent. Arrangements could be made with these men and their firms for them to give a one-hour lecture two or three times a week during the daytime. Full-time professors and instructors would also be used, particularly for teaching the more highly

AT RECEPTION OF FAR EAST-AMERICA COUNCIL OF COMMERCE AND INDUSTRY FOR INDIAN TRADE MISSION TO THE UNITED STATES, WALDORF-ASTORIA HOTEL, NEW YORK CITY, OCTOBER 23, 1946.

From left to right: Clyde N. King, Vice President, International Harvester Export Co.; S. G. Shah, Vice Chairman of the Indian Delegation; Charles Kendrick, Vice Chairman of the California Regional Board of the Far East-America Council; Sir Mokshagundam Visvesvaraya, President of the All-India Manufacturers' Organization and Chairman of the Indian Delegation; and Arthur B. Foye, President of the Far East-America Council.

SHIPPING MAN IN HAWAII

W. W. MacFarlane, Castle & Cooke, Ltd., Steamship Operating Department, one of the best known men on the Honolulu waterfront. He is one of the promising younger men of this shipping community and is president of The Propeller Club of the United States, Port of Honolulu.

Honolulu Advertiser Photo

academic and theoretic subjects. If there is sufficient demand for night classes, they could be arranged for.

The San Francisco College of World Business should be affiliated with one of the local universities, in order to give it the necessary prestige and academic standing, but would be administered by the parent institution, which would be advised by a board of directors, in a manner similar to the way the Hastings College of the Law operated as an affiliated branch of the University of California. The Dean would have to be a man with an outstanding reputation in world affairs and one who would be acceptable to both the parent institution and the board of directors. All activities connected with world business would be represented on the board of directors. For instance, the board would be composed of an outstanding steamship executive, banker, marine insurance broker, importer, exporter, publisher, and advertising executive. Such organizations as the Institute of Pacific Relations, the San Francisco Bay Area Council, the World Trade Association and World Trade Center might be represented. In that way, both the parent institution and the business men would be able to work together in carrying out matters of policy, selection of faculty, and in deciding which courses should be given and in what manner.

To give an idea of what kinds of courses of instruction might be offered at this proposed San Francisco College of World Business, it has been suggested that courses include the following subjects, which are considered pertinent to any study of present and future international commercial relationships:

World Trade and Shipping

Foreign Market Analysis
Theory of International Trade
Principles and Practices of Exporting
Principles and Practices of Importing
Financing Imports and Exports
Technique of Export Salesmanship and Advertising
Technique of Foreign Buying
Controlling World Trade by Private and Government Monopolies
World Trade Promotion by Foreign Business and Governments
Marine Insurance
Doing Business in Latin America
Air Transportation
Inland Transportation
Ocean Transportation
Technique of Overseas Advertising
Traffic Management
Custom House Brokerage
Staple Commodities of World Trade
Foreign Trade Education (How to Develop Public Opinion in Favor of World Trade)
How to Teach World Trade (For Teachers of the Subject)
Travel Agency Management
International Communications

Economics and Political Science

Comparative Government
American Government and Institutions
Principles of Economics
Political Science
World Economic Development
Money, Banking and Foreign Exchange
International Economic Policy
Business Finance and Organization
Industrial Relations (Personnel Management)
World Trade and World Organization
Marketing
Statistics
Accounting
Seminar, Comparative Governments of Latin America
Seminar, Comparative Governments of the Far East

Regional Geography and History

Economic Geography of Latin America
Economic Geography of the Far East and South Pacific
Economic Geography of Europe, Africa and the Near East
History of the United States (Economic and Political)
History of Latin America (Economic and Political)
History of Europe and the Near East (Economic and Political)
Seminar in Current Inter-American Affairs
Seminar in Current Far Eastern Affairs

Law and Diplomacy

American Foreign Policy and Foreign Service
Commercial Law (Contracts, Negotiable Instruments, etc.)
Foreign and Domestic Corporation and Income Tax Laws
Diplomatic and Consular Practice
Structure and Function of International Organizations
Latin American Law
Far Eastern Law
Admiralty Law

Miscellaneous Subjects of Importance

Foreign Languages
Salesmanship and Public Speaking
Foreign Customs and Religions
Journalism and Foreign Correspondence
Public Relations

Launching of U. S. Coast Guard Lightship Diamond. The Pollock awaits her turn for the ducking. Both vessels were launched at Defoe Shipbuilding Company, Bay City, Michigan. October 16.

Official Coast Guard Photo.

Two New Welded Diesel Lightships

THE LIGHTSHIPS DIAMOND AND POLLOCK are the first light vessels to be designed and built by the Coast Guard since the amalgamation of the Lighthouse Service with the Coast Guard in 1939. They were launched at the Defoe Shipbuilding Company, Bay City, Michigan, on October 16, 1946.

The vessels are also the first all-welded lightships ever constructed, and first to have alternating current throughout. They have a higher degree of subdivision than previous vessels of their type, and have more than sufficient power to maintain station during weather approaching hurricane force.

The vessels, when commissioned and manned, will take station at Diamond Shoal, North Carolina, and Pollock Rip, Massachusetts.

In the all-welded steel frame and shell design, a special effort was made to minimize the possibility of sinking in the event of collision. Watertight transverse bulkheads have been carried up to the weather deck. Sufficient transverse bulkheads have been provided so that flotation can be maintained with two adjacent compartments flooded. The hawsepipe is carried up to the weather deck before leaching to the chain locker.

The main deck of each vessel is continuous. There are two tubular steel masts, one for the light and the other for radio apparatus. The mainmast is fitted for the use of spanker sails.

The vessels are constructed entirely of fireproof and fire-resistant material.

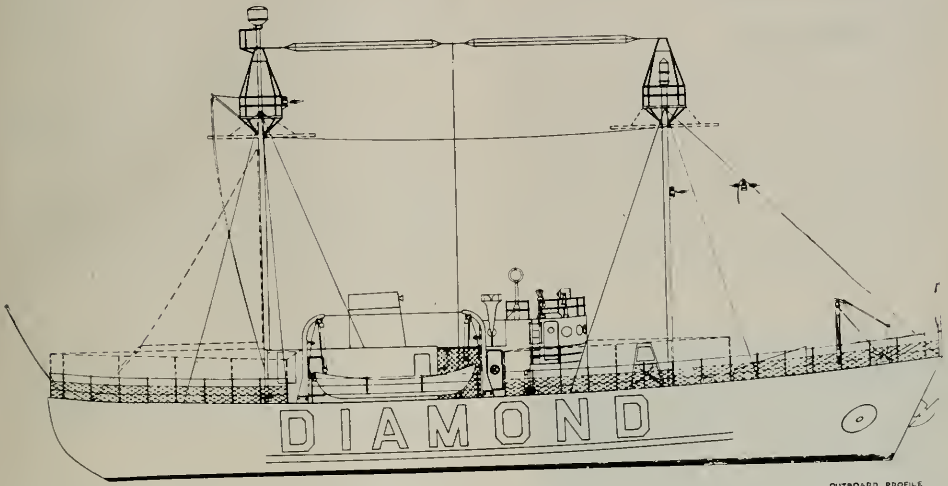
The complement of each lightship is: 1 commissioned officer, 2 chief petty officers, and 14 enlisted men of appropriate ratings. Accommodations are provided for a larger crew than the authorized complement.

The vessels are single screw, each with a General Motors Model 6-278A diesel engine, with clutch reverse, and reduction gearing. This is a six-cylinder air-starting engine cooled by a closed type fresh water system. It will provide 500 shaft horsepower at 650 engine rpm's.

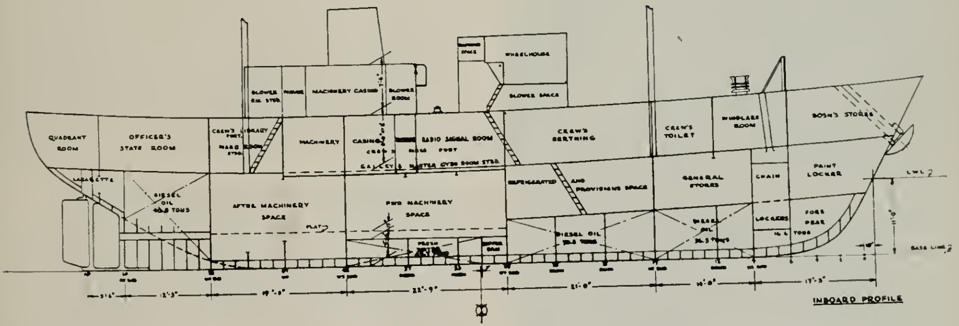
Each ship is fitted with three auxiliary diesel-electric generators, each of 60 kw capacity. A fire tube heating boiler, using diesel fuel, supplies heat for all compartments, and for a single effect evaporator. The evaporator, operating on a 5-pound steam pressure, has a service capacity of 750 gallons per day with a salinity not exceeding one-half grain.

Pertinent specifications of the lightships Diamond and Pollock are as follows:

Length over-all	128 feet
Length on load water line	112 feet
Beam, molded at second deck	30 feet
Depth, molded main deck at side amidships	21 feet 6 inches
Mean draft	11 feet
Height of light above water line	57 feet
Candlepower of light	15,000 candlepower
Displacement	630 tons (about)
Shaft horsepower	500 at 240 rpm of shaft



OUTBOARD PROFILE



INBOARD PROFILE

Inboard and outboard profile views of the first lightships to be designed and built by the Coast Guard since 1939.

Washington Digest

Editor's note: Voluminous data on most of these items is on file in our office, and added details will be furnished by mail, on request.

Acheson Reveals Details of Proposed Shipping Body

Details of the recommendations of the United Maritime Consultative Council made at the meeting of the international shipping group which closed October 30, 1946, were revealed when Congressional maritime and foreign affairs leaders received from Dean Acheson, Acting Secreary of State, copies of the UMCC recommendations, of a draft convention for a permanent Inter-Governmental Maritime Consultative Organization, and a draft of an agreement for a Provisional Maritime Consultative Council to bridge the gap until the participating Governments ratify the proposed agreement for a permanent organization.

Scope and purpose of the proposed permanent organization were set forth in the draft convention, as follows: "I. To provide machinery for cooperation among Governments in the field of Governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade, and to encourage the general adoption of the highest practicable standards in matters concerning maritime safety and efficiency of navigation; 2. To encourage the removal of all forms of discriminatory action and unnecessary restrictions by Governments affecting shipping engaged in international trade so as to promote the availability of shipping services to the commerce of the world without discrimination; 3. To provide for the consideration by the Organization of any shipping problems of an international character involving matters of general principle that may be referred to the Organization by the United Nations. Matters which are suitable for settlement through the normal processes of international shipping business are not within the scope of the Organization; 4. To provide for the exchange of information among Governments on matters under consideration by the Organization."

New United States Trade-Mark Law

The Lanham Trade-Mark Act which will be the Trade-Mark Law of the land beginning July 5, 1947, has been summarized in layman language in a pamphlet issued by the New York Patent Law Association. The law is of direct interest to a good many exporters, and importers should be generally familiar with the new statute, particularly Section 44, which is summarized as follows by Lyford M. Morris of the Oakland Chamber of Commerce.

"Foreign nationals and residents of convention countries are entitled to the same benefits under the new Act as citizens and residents of the United States provided they have home registrations or have used their marks in commerce with the United States. If applications for registrations are filed by this class of persons within six months of the basic foreign applications, United States applications will be accorded the same force and effect as though filed on the same date as the basic foreign applications, but rights acquired by third parties in this country before the foreign applications were filed will not be affected."

The New York Patent Law Association has a limited number of copies available at 25 cents each. Those interested should contact the Secretary, Elmer R. Helferich, 6 East 45th Street, New York 17, N. Y.

Export-Import OPA Control Off

Almost unnoticed in the flurry over junking of OPA price controls was the fact that those applying to exports and imports went out the window, too. The effect of the removal of price controls from export is to eliminate checking of prices in connection with the issuance of licenses to export. In the case of imports, the removal means that importers can now compete in buying in world markets and pay world competitive prices for the goods and products they wish to buy. Other government controls over exports and imports, however, are not affected, such as licensing, priority ratings and allocations.

California Sales Tax on Exports Invalid

On November 25, the Supreme Court in Washington declared invalid the California 3 per cent sales tax when levied against oil sold for export. Validity of the tax was challenged by the Richfield Oil Corporation of Los Angeles in a suit to recover $1515 paid under protest as a 3 per cent sales tax on a cargo of fuel oil sold to the New Zealand Government. According to the United

Press release from Washington, Justice Douglas said: "We concluded that the tax which California has exacted from (Richfield) is an impost upon an export . . . and is therefore unconstitutional." Richfield had contended that the tax was illegal because it violated the ban in the State Constitution against State taxes on exports. The State of California had maintained that deliveries of the oil to foreign governments was unconstitutional within the borders of the State, and consequently the tax was on interstate sales, not exports. It is understood that about $2,500,000 in taxes, interest, and penalties are involved in similar suits by other companies now pending in California courts.

Texaco Charts at Boat Show

Largest single booth on the third floor of Grand Central Palace, the Texaco exhibit at the 1947 National Motor Boat Show offers an interesting display of the company's outstanding special services to boat owners and the large and varied line of Texaco marine lubricants and fuels.

The exhibit covering 800 square feet of floor space occupies booths 77 to 84, directly opposite the north bank of elevators, the same location used by Texaco in prewar years. Comfortable chairs and settees are arranged around the display for the comfort of foot-weary show visitors.

Texaco Waterways Service is well represented at the exhibit and information about the waterways may be obtained for the asking.

Texaco Cruising Charts

The 1947 Texaco Cruising Charts are now being prepared and will be available for distribution in April. The new charts, completely redrawn and containing considerably more detail than the prewar issues, may be ordered at the Boat Show and will be mailed as soon as they come off the press. Although not intended as a substitute for Government publications they are an invaluable aid in planning cruises. Principal lights and buoys, tide tables, distances between ports, refueling points and many other items of interest to the cruising yachtsman are shown. The list of 1947 Texaco Cruising Charts, obtainable without cost, follows:

(1) Eastport to Block Island
(2) Long Island and Long Island Sound
(3) Staten Island to Cape May
(4) Delaware and Chesapeake Bays
(5) Cape Henry to Key West
(6) Gulf Coast
(7) Hudson River and Lake Champlain
(8) Great Lakes and Illinois Waterway

A third edition of Texaco's famous "Cruising With Safety" has been prepared and is ready for distribution. Tens of thousands of copies of the second edition were used during the war for instruction purposes by the armed services and U. S. Power Squadrons, and the new book, while retaining many of the basic features of the previous issue, has been brought up to date to meet modern developments.

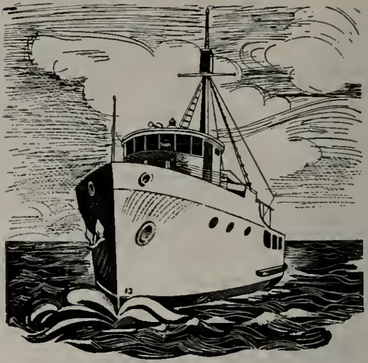
Murals depicting the company's modern marinas and special services decorate the booth and a mural of Miss Great Lakes which, fueled and lubricated with Texaco products, broke every Gold Cup class record in winning the President's Cup Regatta at Washington, D. C., illustrates the company's postwar interest in the development of racing craft.

Large Stern Fender by C. J. Hendry ▶

This is a large stern fender for Standard Oil tug, Despatch #9, made by the C. J. Hendry Co. of San Francisco. The center heart is of chain surrounded by a pudding of hemp fibre which is all enclosed in a new mesh of 3¾# sisal rope. All rope products are by the Columbian Rope Company. The fender is 24" maximum diameter and 27 feet in length, tapered to suit. The total weight is approximately 3000 pounds.

Two other bow fenders of somewhat similar type and construction, but tailored to the hull, are also in process of manufacture.

Coast COMMERCIAL CRAFT



Stability Problem of Tuna Clippers

By DAVID W. DICKIE

MOST STABILITY DIFFICULTIES can be ascribed to carelessness. Probably the only exception to this is the tuna clipper and in that case the complications arise out of the fact the tuna clipper is a tanker that is being loaded at sea.

The tuna boats that fish close to shore and pack the catch in ice give very little trouble from a stability point of view provided the design is intrinsically stable in the first instance. The tuna clippers are perfectly stable in all conditions when the fish are stowed either wholly or in part. It is during some of the operations between times that all of the trouble has occurred.

The tuna clippers are divided into three general classes:

(a) Boats under 90 feet long overall with a flush deck extending the full length or a flush deck extending to the middle of the house with a raised deck 2 to 3 feet high extending from the middle of the house to the bow.

(b) Boats from 85 feet to 110 feet long with a flush deck extending the full length and a boat deck 7 feet above the main deck extending from the forward end of the bait boxes to the bow.

(c) Boats over 100 feet total length, the same as type (b) but with a house on the boat deck for the crew's quarters.

The ice boats are practically obsolete except in the smaller sizes. They have bins in the hold to stow the fish in ice—a layer of crushed ice—then a layer of fish—alternately until they are loaded. This type of boat is now fitted with refrigeration to keep the ice from melting.

The brine boats have bulkheads subdividing the hold into wells having a sea water capacity of from 15 to 24 tons each along both sides, and an alleyway down the center for the piping and refrigeration control equipment.

The refrigeration equipment is governed by the size of the largest pair of wells—the stability is affected by the free surfaces of four wells, two port and two starboard, and the loading is affected by the number of wells. Several of the boats have had to be altered dividing one or more of the wells to facilitate loading. Ninety-foot boats should have 4 wells on each side of the alley; 100 to 115-foot boats, 5 wells on each side; 125 to 140 feet, 6 wells on each side; 140 to 150 feet, 7 wells on each side.

All of the tuna clippers are fitted with bait boxes on the after deck for live bait and with some of the wells in the hold also fitted to carry live bait.

The fuel capacity is divided so part is in tanks for the voyage home—part is carried in steel wells which are cleaned for stowing fish and in some instances fuel is

PARTICULARS OF SHIP

LENGTH OVER ALL	149'-9¾"
LENGTH BETWEEN PERPENDICULARS	148'-8"
BREADTH MOLDED	32'-2¾"
BREADTH OUTSIDE OF PLANKING	32'-10¾"
DEPTH MOLDED – TOP OF KEEL TO TOP OF BEAM AT SIDE	16'-10¾"
DEPTH OF RABBET BELOW TOP OF KEEL	0'-3½"
THICKNESS OF DECK	0'-3¼"
DEPTH – RABBET OF KEEL TO TOP OF DECK AT SIDE	17'-7½"
DRAFT OF MAIN PORTION FROM RABBET	
DRAFT OF APPENDAGE	
DRAFT OF KEEL BELOW RABBET	1'-1"
DRAFT FULL MEAN	
CALCULATED WEIGHT	
" C G ABOVE RABBET	
" C G – FORWARD – AFT – OF "H"	
WATERLINE INTERVAL	22"

DISPLACEMENT TABLE

NUMBER 247979

NAME PAN AMERICAN

LONGITUDINAL INTEGRATION BY TCHEBYCHEFF'S SECOND RULE

VERTICAL INTEGRATION BY SIMPSON'S FIRST RULE

DAVID W DICKIE
ENGINEER AND NAVAL ARCHITECT
SAN FRANCISCO CALIFORNIA

DIRECTIONS AND MULTIPLIERS

AREA OF WATER PLANE – SUM OF COLUMN 'A' MULTIPLIED BY (L÷15 X 2) = SQ. FT.	
C G OF WATERPLANE – DIFFERENCES OF COLUMN 'B' MULTIPLIED BY L÷15 AND DIVIDE BY SUM OF COLUMN 'A' = FEET	
CORRECTION FOR LONGITUDINAL INERTIA (DIFFERENCES OF COL. B')² DIVIDED BY SUM OF COL. 'A' – THE ABOVE FUNCTION SUBTRACTED FROM SUM OF COLUMN 'D' GIVES FUNCTION FOR INERTIA OF WATER PLANE ABOUT C.G.	
LONGITUDINAL INERTIA – MULTIPLY COLUMN 'D' AFTER CORRECTION BY 2(L÷15)³ = INERTIA OF WATER PLANE ABOUT C G. OF WATER PLANE	
LONGITUDINAL 'BM' – DIVIDE LONGITUDINAL INERTIA BY DISPLACEMENT (CU FT) INDICATED IN COMBINATION TABLE – RESULT = FEET	
TRANSVERSE INERTIA – MULTIPLY SUM OF COLUMN 'C' BY (2÷3)(L÷15) RESULT = INERTIA OF WATER PLANE FT⁴	
TRANSVERSE 'BM' – DIVIDE TRANSVERSE INERTIA BY DISPLACEMENT (CU FT) INDICATED IN COMBINATION TABLE RESULT = FEET	
TONS PER 1" IMMERSION – DIVIDE AREA OF WATERPLANE BY (35 X 12)	
MOMENT TO CHANGE TRIM 1" = 'GM' X DISP IN TONS ÷ (LENGTH X 12) = FT TONS	
DISPLACEMENT OF MAIN PORTION – MULTIPLY THE SUM OF (FUNCTIONS FOR DISPLACEMENT) BY WATER LINE INTERVAL X 2 X L ÷ (3 X 35 X 15) = RESULT IN TONS	
VERTICAL C B – DIVIDE SUM OF FUNCTIONS FOR V C B BY SUM OF FUNCTIONS FOR DISPLACEMENT AND MULTIPLY BY WATER LINE INTERVAL	
LONGITUDINAL 'C B' – DIVIDE SUM OF FUNCTIONS FOR L.C B' BY SUM OF FUNCTIONS FOR DISPLACEMENT AND MULTIPLY BY (L ÷ 15)	
MIDSHIP AREA – MULTIPLY SUMS OF FUNCTIONS FOR AREA BY 2 X W L I. ÷ 3 RESULT = SQUARE FEET	
WETTED SURFACE – MULTIPLY SUMS OF GIRTHS BETWEEN WATERLINES BY 1.03 X 2 X L ÷ 15 AND ADD SUCCESSIVE RESULTS = SQUARE FEET	

SPACING OF ORDINATES

DIVIDE THE LENGTH 'L' INTO 10 EQUAL PARTS – SET OFF ON EACH SIDE OF [illegible] A DISTANCE [illegible] – FROM THESE POINTS AND FROM [illegible] RAISE ORDINATES WHICH WILL BE THE ORDINATES USED ON THIS SHEET

PRELIMINARY TABLE

		N° 0 – L = 115.73 H + 5.82 N° 1 – L = 120.14 H + 7.35				NO 2 – L = 122.54 C G = H + 6.62 N° 3 – L = 125.21 C G = H + 8.74						
		N° 0 W L		N° 1 W L		N° 2 W L				N° 3 W L		
ORDINATE LETTERS	LEVERS	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W P	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W.AREA	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W.P.A.	FUNCTIONS FOR LONG. MOM. OF I	CUBES OF ORDINATES	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W.P.A.	CUBES OF ORDINATES
		A	B	A	B	A	B	D	C	A	B	C
FORWARD A	7	.67	4.55	.68	4.55	1.21	8.47	59.29	1.772	1.55	10.85	3.724
B	6	.84	3.90	3.11	18.66	4.70	28.20	169.20	103.823	5.44	32.64	157.464
C	5	1.20	6.00	5.13	25.65	7.45	37.45	187.25	430.190	8.62	43.10	640.504
D	4	2.00	8.00	6.38	25.52	9.29	37.16	148.64	801.765	10.82	43.28	1266.723
E	3	2.83	8.49	7.49	22.47	10.98	32.94	98.82	1323.753	12.95	38.85	2171.747
F	2	3.55	7.10	8.29	16.58	12.16	24.32	48.64	1798.046	14.31	28.62	2930.346
G	1	4.04	4.06	8.77	8.77	12.79	12.79	12.79	2092.241	14.97	14.97	3354.790
C.B.P. H	0	4.44	42.10	9.10	122.20	13.24	241.33	0.00	2320.940	15.33	212.47	3602.686
AFT K	1	4.50	4.50	9.14	9.14	13.33	13.33	13.33	2368.531	15.40	15.40	3652.264
L	2	4.21	8.42	8.79	17.58	13.05	26.10	52.20	2222.446	15.27	30.54	3540.350
M	3	3.63	10.89	7.79	23.37	12.02	36.06	108.18	1736.654	14.75	44.25	3209.047
N	4	2.87	11.48	6.00	24.00	9.99	39.96	159.84	997.003	13.47	53.88	2444.009
O	5	2.15	10.75	4.24	21.20	7.63	38.15	190.75	444.195	11.51	57.55	1524.866
P	6	1.34	8.04	2.39	14.34	4.51	27.06	162.36	91.734	7.82	46.92	478.212
Q	7	.65	4.55	.71	4.97	.72	5.04	35.28	.373	2.35	16.45	12.978
SUMS		38.75	38.53	87.97	114.58	[illegible]	83.78	446.57	16723.530	64.32	264.99	29009.894
[illegible]			-6.53		+7.12		-4.37	[illegible]			-32.52	
[illegible]			-.3291		+.694		-.2682	444.45			-.2695	
[illegible]		537.90	+2.53	[illegible]	[illegible]	[illegible]	+8.55	[illegible]	9080.06	[illegible]	+6.86	161436.[illegible]
LONG AND TRANS. B.M.								264.675	15.053			15.352
[illegible]		1.424		3.555		5.174		232.728		6.54		

		N° 4 – L = 132.629 C G = H + 3.69 N° 5 – L = 141.4 C G = H + 1.95							N° 6 – L = 145.25 C G. = H + 0.39 N° 7 – L = 146.1 C G = H + 0.16						
		N° 4 W.L				N° 5 W.L			N° 6 W L.				N° 7 W L		
ORDINATE LETTERS	LEVERS	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W.P.A.	FUNCTIONS FOR LONG. MOM. OF I	CUBES OF ORDINATES	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W.P.A.	CUBES OF ORDINATES	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W.P.A.	FUNCTIONS FOR LONG. MOM. OF I	CUBES OF ORDINATES	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W.P.A.	CUBES OF ORDINATES
		A	B	D	C	A	B	C	A	B	D	C	A	B	C
FORWARD A	7	.89	12.95	90.65	6.372	2.02	14.14	8.242	2.12	14.84	103.88	9.528	2.27	15.89	11.697
B	6	6.01	36.04	216.36	217.082	6.49	38.94	273.365	6.83	40.98	245.88	318.612	7.15	42.90	365.526
C	5	9.49	47.45	237.25	854.670	10.23	51.15	1070.599	10.72	53.60	268.00	1231.925	11.09	55.45	1363.938
D	4	11.90	47.60	190.40	1685.159	12.71	50.84	2053.226	13.17	52.68	210.72	2284.322	13.52	54.08	2471.326
E	3	14.07	42.21	126.63	2785.366	14.80	44.40	3241.792	15.08	45.24	135.72	3429.288	15.33	45.99	3602.686
F	2	15.36	30.72	61.44	3623.879	15.88	31.76	4004.529	16.00	32.00	64.00	4096.000	16.10	32.20	4173.281
G	1	15.88	15.88	15.88	4004.529	16.21	16.21	4259.406	16.29	16.29	16.29	4322.781	16.30	16.30	4330.747
C.B.P. H	0	16.09	232.87	0.00	4165.510	16.35	247.44	4370.723	16.39	255.63	0.00	4402.880	16.40	262.81	4410.944
AFT K	1	16.11	16.11	16.11	4181.062	16.33	16.33	4354.703	16.32	16.32	16.32	4346.708	16.40	16.40	4410.944
L	2	16.07	32.14	64.28	4149.956	16.18	32.36	4235.801	16.20	32.40	64.80	4251.528	16.28	32.36	4316.625
M	3	15.68	47.04	141.12	3855.122	15.67	47.01	3847.751	15.79	47.37	142.11	3936.818	15.86	47.58	3989.418
N	4	14.55	58.20	232.80	3080.271	14.45	57.80	3017.196	14.69	58.76	235.04	3170.045	14.91	59.64	3314.614
O	5	12.81	64.05	320.25	2102.071	12.68	63.40	2038.781	13.01	65.05	325.25	2202.074	13.47	67.35	2444.109
P	6	9.05	54.30	325.80	741.218	8.78	52.68	676.836	9.45	56.70	340.20	843.909	10.15	60.90	1045.678
Q	7	2.68	18.76	131.32	19.249	2.59	18.13	17.374	3.42	23.94	167.58	40.002	3.95	27.65	61.630
SUMS		77.60	293.60	2179.29	35471.516	81.37	287.71	37470.258	105.48	300.34	2335.79	38886.430	189.10	312.04	40311.363
[illegible]			-27.79	10.71			-46.27			-44.91	10.87			-49.27	
[illegible]			-.2874	2151.52			-.2093			-.2339	2324.92			-.2537	
[illegible]		3445.[illegible]	+3.42	29742934	253064	3415.93	-.14	2754797	3583.87	-1.93	4192880	250486.44	3685.2[illegible]	-2.36	261754.42
LONG AND TRANS. B.M.				185.144	13.057			18.679			147.216	8.734			7.446
[illegible]		7.478		541.578		8.415			8.533		556.368		8.774		

		8 – L = 146.47 H + 0.16			
		N° 8 W L			
ORDINATE LETTERS	LEVERS	OFFSETS FOR W.AREA	MOM. FOR C.G. OF W.P.A.	FUNCTIONS FOR LONG. MOM. OF I	CUBES OF ORDINATES
		A	B	D	C
FORWARD A	7	2.45	17.15	120.05	14.706
B	6	7.47	44.82	268.92	416.833
C	5	11.49	57.45	287.25	1516.911
D	4	13.77	55.08	220.32	2610.970
E	3	15.43	46.29	138.87	3673.650
F	2	16.12	32.24	64.48	4188.853
G	1	16.36	16.36	16.36	4378.747
C.B.P. H	0	16.40	269.33	0.00	4410.944
AFT K	1	16.40	16.40	16.40	4410.944
L	2	16.28	32.56	65.12	4314.825
M	3	15.90	47.70	143.10	4019.679
N	4	15.05	60.20	240.80	3408.843
O	5	13.65	68.25	341.25	2543.307
P	6	10.51	63.06	378.36	1160.936
Q	7	4.15	29.05	203.35	71.473
SUMS		91.37	317.22	2504.54	41033.636
[illegible]			-47.89	1.98	
[illegible]			-.2444	2442.58	
[illegible]		3737.35	-2.28	464.1424.[illegible]	267610.43
LONG AND TRANS. B.M.				10.608	6.373
[illegible]		9.898		72.353	

COMBINATION TABLE PUT BASE AT VIRTUAL RABBET LINE IN WOOD VESSELS AND MOLDED BASE IN STEEL VESSELS

NOTE NUMBERS IN THE COLUMNS FOR VERTICAL LEVERS DENOTE THE WATER LINES WHOSE PARTICULARS ARE TO BE ENTERED

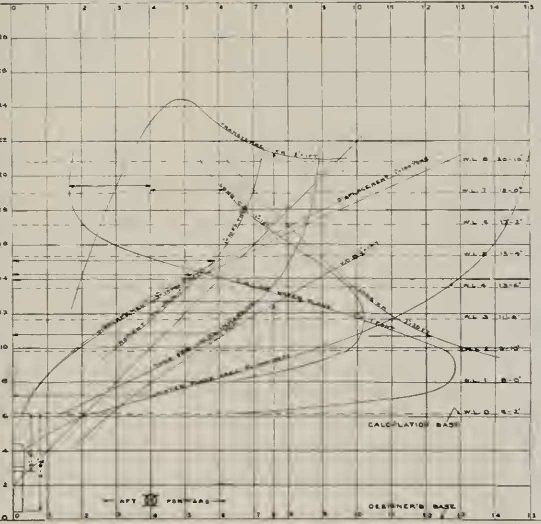
		RESULTS TO N° 2 WATERLINE							
	SIMPSON'S MULT°	SUMS OF ORDS	FUNCTIONS FOR DISP'T	LEVERS ABOVE BASE	FUNCTIONS FOR VERT. C B	[illegible]	FUNCTIONS FOR LONG C B	SIMPSON'S ( ) MULT°	FUNCT'S FOR AREAS
						BROUGHT FORWARD			
	1	597.94	597.94	0	0.00	+2.53	+1512.79	4.46	4.46
	4	[illegible]	5636.00	1	5636.00	+0.64	[illegible]	9.10	36.40
	1	[illegible]	[illegible]	2	4179.[illegible]	+8.55	[illegible]	13.24	13.24
SUMS CARRIED FORWARD			[illegible]		[illegible]		[illegible]		54.10
[illegible]				[illegible]		4.102			68.12
[illegible]		CU FT	5138.[illegible]		[illegible]		+42046.1		
[illegible]		"	91.76	[illegible]	1227.60	[illegible]	-7616.6		4.68
AFTER APPENDAGE	"								
FORWARD APPENDAGE	"								
[illegible]									76.80
TOTAL DISPT MOLD.	CU FT								
BILGE KEELS	"								
RUDDER	"								
PROPELLERS	"								
SHAFTS	"								
SHAFT BRACKETS	"								
BOSSING	"								
TOTAL DISPT FOR BM			5050.44	[illegible]	19966.05	5490	34435.5		
SHELL [illegible]									
TOTAL DISPT TONS			24.67						

		RESULTS TO N° 4 WATERLINE							
	SIMPSON'S MULT°	SUMS OF ORDS	FUNCTIONS FOR DISP'T	LEVERS ABOVE BASE	FUNCTIONS FOR VERT. C B	[illegible]	FUNCTIONS FOR LONG C B	SIMPSON'S ( ) MULT°	FUNCT'S FOR AREAS
BROUGHT FORWARD			8448.78		9345.60		+68802.[illegible]		54.16
	1	[illegible]	2174.84	2	4349.[illegible]	+8.55	+18594.94	13.24	13.24
	4	[illegible]	[illegible]	3	[illegible]	+6.06	+46577.83	15.33	61.32
	1	[illegible]	3144.56	4	12562.24	+3.02	+9466.40	16.09	16.09
SUMS CARRIED FORWARD			[illegible]		59856.92		+134599		144.75
[illegible]				[illegible]		66.[illegible]			74.92
[illegible]		CU FT	[illegible]		[illegible]		+99592.[illegible]		
[illegible]		"	91.76	[illegible]	1227.40	8.354	7616.6		4.66
[illegible]									87.[illegible]
TOTAL DISPT FOR BM			16012.61	[illegible]	65834.30	.57426	92273.54		
TOTAL DISPT TONS			457.505						

		RESULTS TO N° 6 WATERLINE							
	SIMPSON'S MULT°	SUMS OF ORDS	FUNCTIONS FOR DISP'T	LEVERS ABOVE BASE	FUNCTIONS FOR VERT. C B	[illegible]	FUNCTIONS FOR LONG C B	SIMPSON'S ( ) MULT°	FUNCT'S FOR AREAS
BROUGHT FORWARD			24716.42		55836.92		+163459.31		144.75
	1	[illegible]	3143.56	4	12562.24	+3.02	+9484.69	16.09	16.09
	4	[illegible]	[illegible]	5	68388.60	-0.14	-1914.09	16.33	63.40
	1	[illegible]	3582.87	6	21503.22	-1.93	-6908.55	16.35	16.39
SUMS CARRIED FORWARD			43112.77		42314.98		+164040.97		242.63
[illegible]				[illegible]		3.636			296.55
[illegible]			27356.71		+15806.49		100247.26		
[illegible]			91.74	1.344	-1227.60	-8.354	-7616.6		16.68
[illegible]									301.23
TOTAL DISPT FOR BM			34680.6[illegible]	4.34	180578.88	3.2324	92439.66		
TOTAL DISPT TONS			[illegible] 733						

		RESULTS TO N° 8 WATERLINE							
	SIMPSON'S MULT°	SUMS OF ORDS	FUNCTIONS FOR DISP'T	LEVERS ABOVE BASE	FUNCTIONS FOR VERT. C B	[illegible]	FUNCTIONS FOR LONG C B	SIMPSON'S ( ) MULT°	FUNCT'S FOR AREAS
BROUGHT FORWARD			45112.71		142310.38		+6804097		242.63
	1	3583.87	3583.87	6	21503.22	-.95	-6908.55	16.39	4.39
	4	3685.14	[illegible]	7	[illegible]	-2.36	-34788.25	16.40	6.40
	1	3737.35	3737.35	8	29898.64	-2.28	[illegible]	16.40	16.46
SUMS CARRIED FORWARD			67747.7[illegible]		316898.44		+13742.02		34.02
[illegible]				[illegible]		4.93			[illegible]
[illegible]			[illegible]		+155443.54		[illegible]		
[illegible]			91.74	1.344	-1227.60	-8.354	-7616.6		10.68
[illegible]									427.48
TOTAL DISPT FOR BM			41963.46	[illegible]	353715.96	1.4745	61853.02		
TOTAL DISPT TONS			1150.54						

CURVES	SCALE
DISPLACEMENT CUBIC FEET	
DISPLACEMENT TONS	
DISPLACEMENT FRESH WATER TONS	
TONS PER 1" IMMERSION	
AREA WATER PLANES SQ FT	
CENTER OF GRAVITY OF W P OR	
CENTER OF FLOTATION	
VERTICAL CENTER OF BUOYANCY F B	
LONGITUDINAL CENTER OF BUOYANCY	
TRANSVERSE MOMENT OF INERTIA FT⁴	
TRANSVERSE METACENTER B M	
TRANSVERSE METACENTER K M	
LONGITUDINAL MOMENT OF INERTIA FT⁴	
LONGITUDINAL METACENTER B M	
LONGITUDINAL METACENTER K M	
CENTER OF GRAVITY ABOVE BASE KG	
METACENTRIC HEIGHT GM	
MOMENT TO CHANGE TRIM ONE INCH	
WETTED SURFACE SQ FT	
MIDSHIP SECTION	
BODY PLAN	
LONGITUDINAL PROFILE	
HORIZONTAL SCALE	
VERTICAL SCALE	
COEFFICIENTS	
BLOCK	
MIDAREA	
PRISMATIC	
WATER PLANE	
VERTICAL PRISMATIC	
ADDITION TO DISPLACEMENT FOR 10", 20" ETC TRIM BY STERN – HEAD	



WETTED SURFACE

0 TO 1	3 TO 4	6 TO 7
A –	A –	A –
B –	B –	B –
C –	C –	C –
D –	D –	D –
E –	E –	E –
F –	F –	F –
G –	G –	G –
H –	H –	H –
K –	K –	K –
L –	L –	L –
M –	M –	M –
N –	N –	N –
O –	O –	O –
P –	P –	P –
Q –	Q –	Q –

1 TO 2	4 TO 5	7 TO 8
A –	A –	A –
B –	B –	B –
C –	C –	C –
D –	D –	D –
E –	E –	E –
F –	F –	F –
G –	G –	G –
H –	H –	H –
K –	K –	K –
L –	L –	L –
M –	M –	M –
N –	N –	N –
O –	O –	O –
P –	P –	P –
Q –	Q –	Q –

2 TO 3	5 TO 6	SUM
A –	A –	KEEL
B –	B –	0 TO 1
C –	C –	
D –	D –	1 TO 2
E –	E –	
F –	F –	2 TO 3
G –	G –	
H –	H –	3 TO 4
K –	K –	
L –	L –	4 TO 5
M –	M –	
N –	N –	5 TO 6
O –	O –	
P –	P –	6 TO 7
Q –	Q –	
		7 TO 8

carried is one or two of the bait boxes for the outbound voyage.

The stability problem consists in making a calculation that:

1. Will take into account furnishing flowing water to all compartments that are used for live bait.

2. Permit fuel to be used from wells, bait boxes and tanks in proper sequence.

3. Permit cooling water for refrigerating the fish to be filled and discharged as the varying temperatures and procedure dictates.

4. Provide for fish on deck in the interim between catching and stowing them.

5. Provide for the contingency of water coming over the rail to flood the deck.

6. Provide a margin of safety to cover complete changes of fishing procedure. It does not occur to the fishermen to ask in advance what effect an operation will have on the stability of the boat.

The disconcerting phases of the problem are the ones on which it is most difficult to obtain even approximate data. Fishing is done where the depth of water ranges in the neighborhood of 50 fathoms. The wave period from crest to crest is reported to be about 8 seconds. If the rolling period of the boat is 8 seconds, the boat and wave periods will synchronize. Water will come over the rail flooding the deck and the angle of roll will increase until the vessel overturns.

The wood boats are from 15″ to 24″ thick from the outside of the planking to the inside of the well. The bulwark is at least 12″ thick; so the moment of inertia of the free surface of the water tends to be less than that of the waterplane of the vessel itself, thereby providing some margin of safety.

The steel vessels are only 7″ thick in way of the wells and the moment of inertia of some of the deck spaces is the same as the outside of the hull. This has added a new complication to an already difficult problem.

William Lambie calculated cross curves of stability by hand and the writer made them with the integrator for some of the vessels, but beyond finding that the vanishing angle was approximately 40 to 50 degrees not a great deal was learned from them.

The effect of free surfaces of liquids in the tanks was calculated for every possible combination of tanks and the loss of metacentric height very seldom exceeded 3″.

However, it is important to keep the volume of the individual double bottom spaces in the steel boats as small as possible on account of the oscillation of the fuel oil therein when it is being transferred elsewhere and consequently has a free surface effect. In other words, in addition to the static effect, if the weight of the fuel oil in any space having free surface is of sufficient magnitude so its dynamic moment progressively increases the angle of roll of the vessel, she will overturn. A later article will discuss the rolling of the vessels.

If the boat is to carry a full load of fish the relationship between the salt water capacity and the fish capacity has to be kept in mind. The weight of fish in any given space is 82 per cent of the salt water that formerly occupied the space.

Therefore, if the boat is loaded with fish to a proper draft, she is going to be loaded with the deck under water if the same spaces are full of salt water. Consequently, certain spaces equal to the difference, or 18 per cent of the space, must be left empty while fishing and salt water is carried in the remaining space.

These considerations left only two other reasons for the vessels overturning—some weights were omitted or moved without being accounted for—or—the metacentric calculation had an error in it somewhere.

Metacentric Calculation

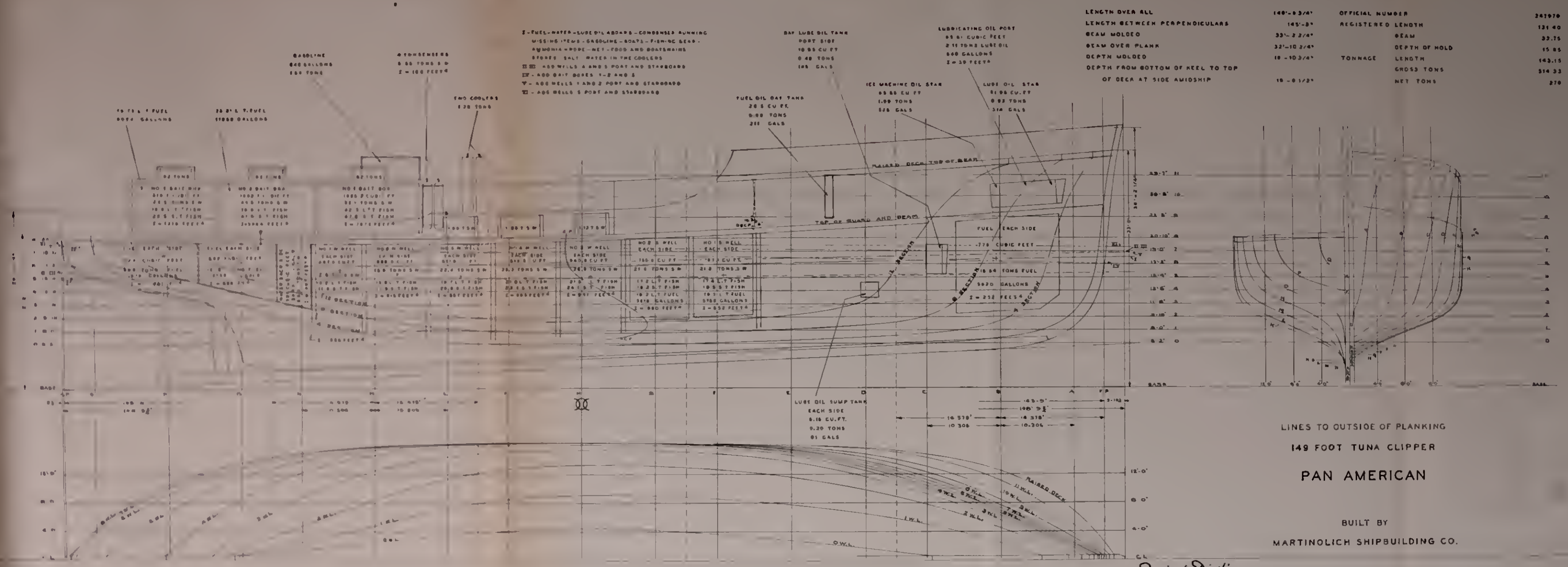
The table, Figure 1, is the form designed by the writer to investigate the metacentric calculation. Tchebycheff's rule is used longitudinally and Simpson's rule vertically. Each waterline is treated as a separate entity and is divided longitudinally into Tchebycheff's spacing using the three ordinate rule. The actual length of the waterline is used in each case so the waterlines of the table are short in the lower body and long in the upper body. This uncovered one of the errors and at the same time eliminated the problem of correcting for the piece at the end that either extended beyond, or did not extend to, the proper ordinate of the rule used.

Occasionally it is advantageous to plot the curve of Tons per Foot Immersion and integrate it on the adding machine by means of the trapezoidal rule using intervals one foot apart to get the displacement. By making a second integration of the displacement curve from the first tape of the machine the vertical moment is obtained.

At the time of making the inclinations there are several cases where the vessel is not floating at the trim used when making the Curves of Form. One of the advantages of this table is that the observed waterline can be put on the lines. If as sometimes happens it approximately coincides with waterline 7 aft and waterline 4 forward, it is possible to take from the table the cubes or ordinates (Column C) for parts of waterlines 7, 6, 5 and 4 and make an approximation for BM right on the job. This would not be possible if corrections had to be made for change of form and length at the ends.

The table shows (Column C) cubes of ordinates for alternate waterlines only, but for these vessels the work must be performed for all the waterlines, in fact on some of the boats it had to be done for intermediate waterlines between to get the curves to come fair.

The tuna boats change trim as much as 8 feet from the Light Ship condition to the "Condition where the First Catch is made." In other words the change of trim is 10 per cent or more of the overall length of the vessel. The waterline length changes from 8 feet to 20 feet due to trim alone depending on the size and model of the boat and it was found that the change of trim no longer



LENGTH OVER ALL	149'-6 3/4"	OFFICIAL NUMBER		247970
LENGTH BETWEEN PERPENDICULARS	145'-8"	REGISTERED	LENGTH	131.40
BEAM MOLDED	33'-2 3/4"		BEAM	32.75
BEAM OVER PLANK	32'-10 3/4"		DEPTH OF HOLD	15.85
DEPTH MOLDED	18'-10 3/4"	TONNAGE	LENGTH	143.15
DEPTH FROM BOTTOM OF KEEL TO TOP OF DECK AT SIDE AMIDSHIP	19'-0 1/2"		GROSS TONS	514.33
			NET TONS	270

LINES TO OUTSIDE OF PLANKING

149 FOOT TUNA CLIPPER

PAN AMERICAN

BUILT BY

MARTINOLICH SHIPBUILDING CO.

David W. Dickie

SCALE 1/4" = 1 FOOT

took place about the Center of Gravity or Center of Flotation of any mathematically known Waterplane.

A separate calculation was made at the actual "Light Ship" trim and an attempt was made to develop a rule that would correlate it with the calculation made at what might be called the mean trim, but it did not work out very well. The reason is inherent in the model of the boat. The builders have made an effort to correct the excessive change of trim by forming the model about a semi-ellipsoid. The segment is placed with the longitudinal axis low at the forward end and high at the after end. The after deadwood is built on below the segment and the flare of the bow is built on above it at the forward end. The additions complicate the mathematics of the problem to such an extent that it becomes impractical to use commercially on account of the time necessary to take all the factors into account.

The custom in the beginning was to put the vessel in the Light Ship condition, find the Center of Gravity of the vessel itself by an Inclining Experiment and add the other weights to it. Unless a separate complete calculation is made for the Light Ship condition there will be an error of from 6 to 8 inches in the height of the Metacenter above base and consequently in the height of the Center of Gravity of the vessel above base, because the height of the Center of Gravity of the vessel is found by deducting the "GM" or Metacentric Height from the "KM" or Metacenter above base.

A change in procedure was made so Inclining Experiment No. 1 is performed with the fuel and water put aboard the ship through a meter into the ship's tanks. Each pair of wells is filled in sequence and the draft taken and each bait box filled and the draft taken. When the vessel is in approximate fishing condition Inclining Experiment No. 2 is made. Then one pair of wells is filled half full of cooling water and Inclination No. 3 is made. A separate calculation for "KM" minus "GM" is made for Inclinations No. 1, No. 2 and No. 3, and the weights aboard deducted. The greatest error of "KG" to date is found to be 0.13 feet.

When the three Inclinations were made and the data for "KM" taken from the regular Curves of Form, the errors in "KG" ranged from a minimum of 0.50 feet to 1.62 feet. The curves of form were correct, but in each case were made for one trim only as usual. The change of trim of the vessel taken in conjunction with inaccuracies in capacity of the tanks accounted for the errors.

Later it was found prudent to incline the vessel at various conditions of loading covering the whole range amounting in all to 6 or more inclinations.

Practically all the offices collaborating in the stability work have had trouble missing some of the weights to go aboard as the boats have had to sail without some important weights due to the war effort.

Refrigeration

In the November 1939 issue of the Pacific Marine Review the writer published the Refrigeration Loads of the Tuna Clipper. An extensive series of experiments covering the methods of removing the heat from the fish was made by Dr. O. W. Lang, Research Associate of the University of California, Hooper Foundation, which developed the following procedure and certain precautions have to be taken to make sure the vessel has adequate stability to be seaworthy while each step of the procedure is carried out:

1. A catch is made when the school of fish is found. Anywhere from 2 to 20 tons of fish are brought on deck, depending on the size of the boat.
2. A well on each side is filled either half full or entirely full with water which has been cooled to receive the fish.
3. As the fish are dropped in, the water rises or overflows out through the deck valve until fish and water reach the top of the well.
4. Some of the cooling water is pumped overboard and more fish are added. This is called repacking.
5. If the vessel has coolers to supply fresh chilled sea water, some of the cooling water can be pumped overboard again and more fish added. The second repacking is attended with some risk of spoiling the fish already in the well, especially if there are no coolers to supply fresh chilled water.
6. It is customary to add salt to the sea water to form brine for a final wet freezing, but salt cannot be used throughout without it penetrating the fish.
7. When the temperature of the fish stowed in the well is brought down to 30 degrees the cooling water is pumped overboard and the fish are chilled dry until the temperature falls to zero.
8. The weight of the fish remaining in the well is from 80 to 82 per cent of the sea water required to fill the well.

There is some difference of opinion about how the coils should be fitted in the wells. The coils are spaced about 8″ centers of 1¼″ pipe galvanized outside. Garnet Wallace Stevens maintains that the coils should be attached directly to the sides of the wells to absorb the heat coming from the outside. The coils gather a triangle of frost which is a maximum at the coil and tapers off to nothing half way between adjoining coils. Ralph E. Manns of the company of the same name advocated keeping the coils 1″ away from the wall. By this method the coils can be installed closer than 8″ centers, but some space otherwise available for stowage of fish has to be sacrificed.

The worst condition that has to be contended with is at the fishing banks just after making the first catch. Taking account of the weights:

1. The steel wells are full of fuel.
2. Some wells are full of flowing sea water containing live bait.
3. At least two of the bait boxes are full of flowing sea water containing live bait.
4. All the fuel tanks of the ship are full, the fuel for the outbound voyage having been used from a bait tank on deck.

5. The fresh water tanks are three-quarters full providing free surface.

6. About 15 tons of fish are on deck which are fluid providing free surface.

7. Two wells are either full, reducing the freeboard, or are half full, providing free surface.

8. The stern is down so the deck is as close to the water as safety permits to avoid the effort required to heave the fish over the rail.

In the above condition the vessel must have sufficient freeboard and metacentric height to be seaworthy.

The membership of the China-American Council, which was organized in October, 1943, now comprises approximately 450 companies representing a cross-section of American industry interested in trade with the Pacific areas.

The Neptune I

A new all-steel welded combination purse seiner and tuna boat, the 82-foot Neptune I has been launched by the Heo Boat Company of Oakland, and is now fishing out of San Pedro. The Neptune I was designed as a year-round fishing boat and has many new features of design and equipment.

The boat is owned by K. Hovden of Monterey, H. E. Ottenbreit, W. C. Crittenden, and A. Simmon of San Francisco.

The boat has an 82-foot length, 21′ 6″ beam, and 10′ 6″ draft. She carries 175 tons of pay-load and has an 18,000 mile cruising range at better than 11 knots. Generous use of high tension corrosion resistant steel has resulted in a saving of weight and is expected to reduce the maintenance expense due to rust. The general construction is along dreadnaught lines with a bulbous bow, a raised pilothouse, and a flying bridge. Besides the saving in weight, the steel construction has other advantages in that more space is obtained in the fish hold when brine tanks are used due to the fact that the tanks can be built out to the wall without an air space as is customary, to avoid dry rot, in wood construction. There are ballast tanks aft which are used to trim the ship allowing the stern to be lowered while working with the nets, regardless of the load in the hold. Wing tanks in the side of the vessel provide control of the list which is very helpful during brailing operations. The use of these wing tanks also eliminate the center line spreader board which is normally used to keep the load from shifting.

Port view of Neptune I.

Prow view of Neptune I.

There is a capacity on board the 7000 gallons of water and 18,000 gallons of fuel, and the fuel is transferred by an electric transfer pump to a 400 gallon dry tank. There is also a 250 gallon lube oil tank.

The Neptune I is powered with a General Motors twin diesel engine comprised of a matched pair of Series 71, 2-cycle, 6-cylinder diesel engines mounted on a common steel sub-base and geared to one 5″ propeller shaft.

Each engine is coupled to its driving pinion through a clutch which allows either engine to be cut in or out of operation while running, thereby imparting a degree of security not to be found in more conventional propulsion units. Either engine can drive the ship at about two-thirds speed.

The engines are fresh water cooled by built-in heat exchangers, and they are fully protected by an alarm system against low oil pressure or high water temperature.

Adel hydraulic controls make operation from the engine room, crows nest, wheelhouse, or bridge equally convenient.

This twin engine, supplied by Bay Cities Equipment Company, GM distributor at Oakland, is rated at 330 hp. With the present reduction gear, a 63″ propeller is turned at 320 revolutions. The boat is soon to be powered with a General Motors Quad engine consisting of four 6-cylinder engines driving a common shaft through a 4:1 reduction gear. This will double the horsepower to 660, and is expected to turn the same propeller 400 revolutions per minute. Trial runs indicate a speed of over 11 knots will be used for cruising.

The compact arrangement of these 2-cycle diesel engines has eliminated much of the weight and bulk usually found in engines of this horsepower class, and has resulted in many worthwhile features, among which is the saving of from 8 to 10 feet of hold capacity and of about 9 tons in weight!

The ease with which this engine was installed, the process requiring but one hour, using the ship's own boom, is typical of the careful planning that has gone into this design toward reducing maintenance expense. In a matter of hours, replacement engines may be installed and the old ones reworked at leisure under most favorable conditions, thereby avoiding the costly tieups at major overhaul periods.

The deckhouse is luxuriously paneled in hardwood and equipped for a twelve-man crew. It is completely insulated with fibre glass. More than the usual number of flood lights are provided for working the nets at night. All wiring to lights and various electrical units are on independent circuits in leaded and armoured cable.

Modern equipment aboard includes the following: Sperry Gyro magnetic compass and power steering; Kaar 40-watt, 2-way radio phone and direction finder; Submarine Signal Company fathometer; one 3″ electric bilge pump and a 2″ electric fire pump built by the Pacific Pump Company; 25 hp electric winch as well as the 5 hp electric anchor windlass, built by the Heo Boat Works and are supplied by a 50 kw Westinghouse Generator driven by a 6-71 General Motors diesel engine supplying 120 volts dc throughout the ship. All units are pushbutton control.

The propeller shaft is 5″ diameter, Tobin Bronze, running in a Goodrich Cutless bearing, and the propeller is a bronze Doran type "D." The rudder provides for counter steering and is supported on thrust bearings on both top and bottom. Both the wheel and rudder can be changed at sea. The engine room is protected by a Walter Kidde CO_2 equipment. The galley has a Lang oil range and a Frigidaire. Both fresh water and sanitary pumps as well as the bilge pump can be cross connected and used for fire pumps. Engines are silenced by Maxim Silencers.

Neptune I
under way.

Marine Insurance

Reinsurance

The lay mind does not readily visualize the immense capacity of the ordinary freight steamer. Into its immense holds are stowed carload after carload of valuable merchandise. When the loading is completed, many hundreds of thousands of dollars worth of goods, as well as the value of the ship and its freight, are at risk in a single adventure. An underwriter doing a large and varied business cannot control, except in a very limited way by restricting the maximum amount insured under each policy, the aggregate amount which he may have at risk in any one adventure.

This condition necessitates reinsurance by which the underwriter shares his risk with other underwriters. This is done in a variety of ways by sharing on a percentage basis each individual item making up the aggregate amount, by reinsuring all in excess of a given retention, say $100,000, or by reinsuring any loss which he may suffer in excess of a named amount, say $50,000.

Whatever the method, the result desired is to arrange, so far as is practicable, to have average lines on all insured adventures and thus conform to the basic theory of insurance. All of the principles of marine insurance that apply between owner and underwriter apply with equal, if not greater force, in the reinsuring of interests by underwriter with underwriter. Marine insurance, being international in its scope, sees an interchange of reinsurance between the nationals of various countries. With this interchange passes information of a commercial nature, vital to the interest of foreign nations. Not a few of the large German reinsurance companies were sources of vital commercial information to the German Government prior to and during the World War.

It is therefore of the greatest importance that, in so far as possible, reinsurance of export overseas risks should find lodgment in the United States.

—J. D. Winter, president
Atlantic Mutual Ins. Co.
Published by Insurance Society of N. Y.

War Risk Underwriting by M. C. Stopped

Effective December 31, 1946, the United States Maritime Commission discontinued underwriting marine and war risk insurance under authorities that were granted the War Shipping Administration during war years.

London Letter

By Our British Marine
Insurance Correspondent

Welded Ship Warranty

During the past year or two, a lot has been written regarding the disasters which have overtaken about six out of some 3,000 American war-built welded ships. The few broke up afloat, for no apparent cause. The latest interest in these few losses centers around the wording of a warranty. Attention has been called to certain risks which are being placed on American-built welded ships with the policy conditions "Warranted strengthened or . . . additional premium."

Underwriters writing the risks and the brokers placing them are satisfied with the wording of the warranty, but, according to an opinion expressed in technical quarters, the wording may lead to controversy, if not litigation.

The discussion which is proceeding gets on to the difficult and technical question of "crack arrestors" and "rounded inset plates," and the difference of opinion seems to resolve itself into one of "adaptation" as against "strengthening."

In development of this marine insurance shipbuilding problem, the effect of the Marine Insurance Act on the question of "Warranted Strengthened" is given as follows: A ship is insured with the warranty and the risk goes forward at the rate of the slip without the additional premium. She is lost by a peril insured against, stranding, fire, collision, foundering, it does not matter what. The adjuster of claims to the leading underwriter observes the warranty and, very properly, asked whether it had been complied with. It transpires that the ship has been "adapted," that the crack-arrestors have been fitted, that the holes have been drilled in the bilge keels, and so forth.

If the loss were by stranding, fire or collision, the claims adjuster would raise no further point, but suppose that the ship had foundered after breaking up from no apparent cause? The underwriters would have what appears to be a cast-iron case for rejecting the claim. They would contend that the warranty that the ship had been strengthened had not been complied with. If the matter were taken to law, the court would only be concerned with that precise issue.

If it could be proved that the process carried out had, in fact, strengthened the ship, then the underwriters would be liable. If it could only be proved that the process had improved the risk but had not strengthened the ship, it would be of no avail. This defence, in the view of one authority, would be opened to underwriters in the event of a loss from any peril insured against, but it is not thought they would take advantage of a technicality if the loss was from any cause that could not be associated with the feared weakness or defect which caused the warranty to be inserted in the policy.

New Master Cover

News has reached London marine insurance circles that discussions are now being held in Holland about the various aspects of an insurance scheme, so as to simplify its application for everyday use as much as possible. The scheme referred to is the so-called master cover for goods imported from the United States. It is stated, says a Dutch informant, that import licenses, which include a currency license for the import of goods from the United States, are not granted by the official organization for import and export, unless the importer binds himself to declare the goods upon this cover. This cover stipulates a maximum of $8,000,000 per any one steamer and a location clause of 150 per cent. The further contents are practically confined to the fixation of the limit of each underwriter participating in this cover. Twenty-five per cent have been placed in New York with five American companies, and the balance has been split up between the Amsterdam and Rotterdam underwriters, each for 37½ per cent. At Amsterdam 43 firms are to be engaged in this business, and at Rotterdam 22.

The correspondent continues:

> "The master cover leaves the fixing of conditions and rates to the negotiations between importer and first underwriting firm at Amsterdam and Rotterdam. For this purpose, however, it is obligatory for them to make use, directly or indirectly, of an insurance broker at the Amsterdam and/or the Rotterdam exchange, at their own option, provided, of course, that the broker is in possession of a special license of the Netherlands Bank for an insurance account in foreign currency. Brokers in the provinces are obliged to make use of the intermediary of an exchange broker. Premiums and claims are payable in United States dollars."

Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

Lien Holder Seeks Direct Action Against Insurance Company

It is a common practice for plaintiffs in state court civil actions to attach assets of the defendants wherever they may be found so that, in the event of judgment, satisfaction can be easily accomplished. State courts permit attachments of almost any type of asset provided the grounds for attachment are in existence. The situation is slightly different, however, in admiralty and the rule is better and more clearly understood by the facts and decision of the case of the Donald T. Wright, 1940 A. M. C. 291, U. S. D. C., Western Dist of Ken. The libelant in this proceeding brought an action in admiralty against the SS Donald T. Wright *in rem* and against her owner, the Sewell Transportation Company, *in personam* for claims arising out of labor performed on the boat and for goods and merchandise furnished for the use of the boat at the request of the owner.

The Boston Insurance Company was made a party respondent, the libel alleging that it had issued a policy of marine insurance in the amount of $6,000 protecting the steamboat Donald T. Wright against loss by fire, and that the steamboat had been destroyed by fire while the policy was in full force and effect, and asking that the insurance company be required to pay into court the sum which was owing to the Sewell Transportation Company by reason of this loss under its policy. The Boston Insurance Company filed exceptions to the libel on the ground that it stated no cause of action against it and that the libelant could not impress a lien by substitution upon the proceeds of the insurance.

The respondents, steamboat Donald T. Wright and the Sewell Transportation Company, filed an answer to the libel and by separate paragraph made it a cross libel against the Boston Insurance Company, setting out the issuance of the insurance policy, the loss of the steamboat by fire while the insurance was in full force and effect, and asking that the Boston Insurance Company be required to pay into the registry of the court the proceeds due the Sewell Transportation Company by reason of its loss under the policy. The Boston Insurance Company filed exceptions on the ground that it set up new and distinct matters not involved in the issues raised by the original libel, and that the question of liability under the policy of insurance was in dispute and was being litigated in a declaratory judgment suit filed in the Federal

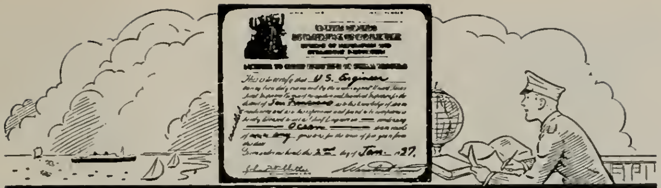
Court by the Boston Insurance Company prior to the filing of the cross libel.

The case arises before the Federal District Court upon exceptions by Boston Insurance Company to both the libel and the cross libel. The court said it is unquestioned that the libelants have an action *in rem* in admiralty against the steamboat Donald T. Wright for the value of the labor and materials furnished by them to the boat, and it is also true that they have an action *in personam* against the Sewell Transportation Company who contracted with them for the furnishing of the labor and materials in question. But they have no action *in personam* against the Boston Insurance Company and any liability which the insurance company has by reason of its policy of insurance covering the steamboat Donald T. Wright is to the Sewell Transportation Company, its insured. The only way in which the libelant could properly bring the insurance company into the action would be to substitute for their lien against the steamboat the proceeds from the insurance covering the steamboat. The libelant claims that this is permissible under Admiralty Law and relies upon the decisions of the Supreme Court in the cases of *Sheppard vs. Taylor*, 30 U. S. 675, and *O'Brien vs. Miller*, 168 U. S. 287, as supporting their position. The Boston Insurance Company relies upon the case of the *City of Norwich*, 118 U. S. 468, and subsequent decisions following the rule expressed in that case, in support of its contention that the lien against the boat cannot be extended to cover the insurance proceeds. The cases referred to, and their respective rulings, are not in conflict. In the case of *Sheppard vs. Taylor, supra*, the King of Spain seized the vessel Warren, imprisoned the crew and condemned the vessel and its cargo. Subsequently the crew was permitted to return to the United States and the King ordered the proceeds to be repaid to the owners. The seamen proceeded against the owners by libel for their wages and were permitted to have their lien against the boat attach to the proceeds which had been paid to the owners as compensation for the illegal seizure of the boat. In that case the court said "the lien will follow the ship and its proceeds into whosoever hands they may come by title or purchase from the owner." In the case of *O'Brien vs. Miller*, the steamboat Johnson was required to put into port for repairs. The master executed a Bottomry bond to meet the expenses of the repairs, which bound the boat, its cargo and freight. The Johnson collided at sea with a British vessel and was sunk with a total loss. The owners of the Johnson libeled the British vessel and recovered judgment for the value of the vessel. The consignors and the consignees of the original cargo of the Johnson filed an action to recover from the owners of the Johnson their share of the sum paid on the Bottomry bond, and the court held that the owners of the Johnson, to the extent of the damages paid on account of the collision, were liable to the libelants as creditors of the ship. In both of these cases the owners of the ship had a claim against others arising out *of the operation of the ship and wrongful acts done to it.* In such cases a creditor's lien against the ship attaches to the proceeds which are recovered by reason of such a claim for damages. In the case of the *City of Norwich*, the vessel took fire and sank with loss of cargo but was subsequently raised and repaired. The owners of her cargo filed a libel against the boat and against the owner. The owner claimed limitation of liability to the value of his interest in the ship and freight as provided under the Act of 1851, 9 Stat. 635, which permitted the owner of any vessel to limit his liability for damages to the value of his interest in the vessel and her freight then pending. The libelants claimed that in order for the owner to take advantage of this statute he must surrender the insurance which he collected from the insurance company by reason of the sinking of the vessel. The court held that insurance placed by the owner was no part of the owner's interest in the ship or freight within the meaning of the law, and that the owner did not have to surrender the proceeds of such insurance in order to take advantage of the limitation of liability. The opinion pointed out *that the proceeds from the insurance was by reason of an independent contract and was a matter entirely collateral to the owner's interest in the vessel, the owner's interest in the vessel remained the same regardless of whether insurance had been taken out or not, and that taking of insurance was optional with the owner as additional protection.* This ruling was followed by many cases.

The court, using the foregoing authorities as a basis for its opinion, held that the lien of the libel against the SS Donald T. Wright did not attach to the proceeds of insurance which might be payable by the Boston Insurance Company to the Sewell Transportation Company. The court also disposed of the additional question of pleading under Rule 56 which did not affect the decision of the point explained above.

Revised Coast Guard Manuals Available

The Merchant Marine Personnel Division, at Coast Guard Headquarters, Washington, D. C., recently announced the revision of two booklets of interest to active members of the merchant marine: "Specimen Examinations for Merchant Marine Deck Officers," and "Manual for Lifeboatmen and Able Seamen." The revision date of each pamphlet is June, 1946. The booklets are now available upon request to the Commandant, U. S. Coast Guard, Washington, or any Coast Guard field Marine Inspection Office.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

The Marine Steam Boiler

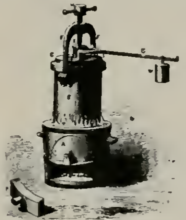
I. Historical Development

In a steam plant the center of operations—the heart of the process—is the boiler or steam generator. If the boiler can supply steam continuously at the proper conditions there is seldom any trouble with the prime mover. This is increasingly true in modern steam plants where the pressures and temperatures are relatively high and the prime mover is a turbine.

Boiler design was one of the "headaches" of the engineers who in the early days sought to apply steam to ship propulsion. Our illustration shows some of these early efforts. It is an interesting side light that the "digester" of Denys (Dioniseus) Papin (1680) is designed on exactly the same principle as "The 20th Century Pressure Cooker" which is now engaging the admiring attention of so many American housewives.

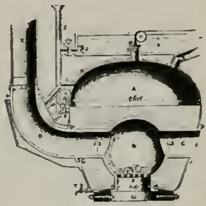
Denys was a professor of Physics in the Sorbonne, Paris. In his time the butcher shops of the poorer quarters of Paris sold horse meat collected from battlefields or from carcasses of worn-out old farm or delivery horses. Much disease and death resulted from this practice and Denys Papin invented his "digester" to cook this meat at higher temperature and so make it more palatable and safer for human consumption. Many of these heavy cast iron pressure cookers with clamped covers and weight-loaded safety valves may be found in the kitchens of France to this day. Incidentally, Papin was the inventor of the safety valve.

Later, in Hesse, Germany, Papin applied this boiler successfully to the rowing of the state barge on the river Fulda. However, he found a "goon squad" from the GRB (Guild of River Boatmen) waiting for him around the bend. These toughs beat up the inventor, dumped his boiler and engine into the river and rowed the state barge back in triumph to its boat house. Papin escaped



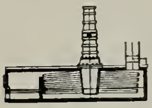
-Papin's Digester, 1680.

FIG 1



-Smeaton's Portable Engine Boiler, 1765.

FIG 2



. — Section of Steam Boiler, 1804.

FIG 3

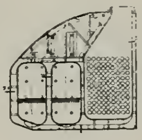


FIG 4
BOX BOILER
TUBES AT SIDE OF FIRES

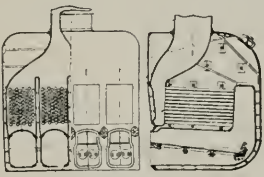


FIG 5
BOX BOILER
FIRE TUBES ABOVE FIRES

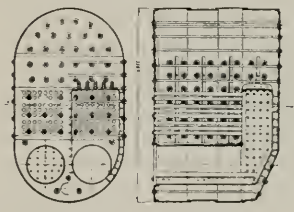


FIG 6
EARLY SCOTCH OVAL BOILER

to England where he wrote a book describing his invention and telling of his research into steam as a power producer.

A century later steam began to take serious hold on the imagination of inventors in many parts of the world, particularly in Great Britain and in America. In America it is interesting to note that most of the early marine boilers were of the water tube variety. This was true of the early boilers patented by Fitch, Stevens, and others, during the last quarter of the 18th century. The Frenchman Carnot had already demonstrated mathematically that higher pressures and temperatures were the keys to fuel economy, but the practical application of his principles had to wait for three-quarters of a century.

That canny Glasgow Scotsman James Watt had added greatly to the economy and performance of steam engines by designing an external condenser and making the cylinder double-acting. All his life he opposed pressures above 10 psi. Did this opposition rise from the fact that at such low pressures more power was obtainable from the use of Watt's condenser than from the action of the steam on the piston?

The first description of a multitubular fire box boiler is contained in the patent issued by U. S. Patent Office to Nathan Read in 1788. This shows a vertical boiler very similar to the coal burning donkey boilers used for many years by sailing vessels and cargo steamers for working cargo in port.

Fire tube boilers gradually evolved into the familiar cylindrical "scotch" marine boiler which was a very serviceable and fairly efficient steam generator and on which practically all the refinements of steam generation and combustion control were applied and tested. Air preheaters in the uptakes, induced and forced draft systems, various types of superheaters, various systems of inducing circulation—the old "scotch" boiler has used them all and before the end of the 19th century it had with its companion the vertical triple expansion engine pushed steam navigation into every port and every river on the earth.

By 1900 marine steam plants were almost unanimously "scotch" marine boilers of 100-260 psi working pressure feeding steam to triple expansion steam engines. These boilers were single or double enders with from two to four coal burning furnaces in each end and made in dimensions ranging up to 24 feet in length and 18 feet in diameter. The larger sizes of these boilers would have a weight with their mountings of 100 to 110 long tons and would take 50 to 60 long tons of water.

Since 1900 the trend has been definitely to water-tube boilers and higher pressures and temperatures.

In all of the literature on the subject of marine power plants up to very recent years credit is given to the engine for fuel economy records. Thus the introduction of compound expansion reciprocating engines about 1850 and of triple-expansion engines in 1881 brought about very marked improvements in fuel consumption per horsepower hour.

Since 1850 the fuel economy has been improved from 3.5 to 4 lbs. of coal per shp hour to about 0.75 lbs. of oil or about 1 lb. of coal per shp hour; thus showing a reduction in fuel consumption of approximately 75 per cent.

While it is true that this remarkable improvement could not have been made without a great improvement in the steam rates of prime movers, it is equally true that the boiler must generate the necessary steam with the economy of fuel required.

In modern plants the boiler and its accessories require intelligent supervision and should have attention from the engineers on watch at least equal to that given the prime mover and its auxiliaries. If the engineer can adjust the boiler installation to continuously provide the necessary quantity of steam at the proper conditions then (barring emergencies) the prime mover will produce the required horsepower with efficient smoothness.

It is very important, therefore, that the engineer should thoroughly understand: the theory of boiler design and construction; the maintenance of boilers; the theory and practice of feed water treatment; the importance of clean heat exchange surfaces in boilers; and the nature and heat content of fuels.

It will be the purpose of this series of articles to treat some or all of these subjects in a simple practical manner and it is hoped that any reader who has a question or a criticism will submit same in writing addressed to The "Chief," Pacific Marine Review, 500 Sansome Street, San Francisco.

Bactericidal Efficiency of Low Pressure Double Effect Distilling Plants

By William W. Payne

(Continued from December)

Feed Water Preheated

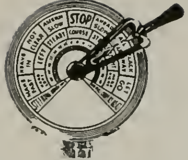
In this series the plant was operated as previously except that auxiliary steam was supplied to the combined sterilizing feed heater and air ejector condenser. This steam supply was regulated either by a hand operated valve or a thermostatically controlled valve so that the feed water entering the first effect shell would be maintained at a fixed temperature. This temperature was maintained at either 165° F. or 175° F. The rate of feed varied for the different runs, and this in effect varied the length of time the water was maintained at the given temperature.

This portion of the study was included to determine the effectiveness of heating the feed water to kill coliform bacteria in the event a plant required this adjunct to insure a safe water. Any possible effect of evaporation on the

(Please turn to page 144)

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

THE SEXTANT

Chapter IX

The Sextant and Coastal Navigation

The sextant is of the greatest value when in sight of land because by measuring the angular height of a lighthouse or a mountain (or any object of which the height is known), the distance off may be found. This operation is known as taking a "vertical sextant angle." With the distance off known, as well as the bearing of the object, a "fix" can be fairly well determined.

A ship's position can also be fairly well fixed by measuring with a sextant the angle between three or more points of land. This operation is known as taking a "horizontal sextant angle."

Taking a Vertical Sextant Angle

Set the index arm of the sextant at zero. Use either the star telescope or just the plain blank tube. Look directly at the object, and by moving the index arm bring the reflection of the upper part of the object (seen in the silvered half of the horizon glass) down to the level of the lower part of the object (seen through the plain glass half of the horizon glass)—generally the horizon.

When observing the sextant angle of a lighthouse, it must be borne in mind that it is the center of the glass lamp that must be reflected down to the sea (high water mark to be strictly accurate) and not the top of the lighthouse, as illustrated in Fig. 19.

In practice no allowance is made for height of tide or height of eye, as by ignoring these the observer is led to believe that he is closer to the object than he really is and therefore, in most cases, is given an added margin of safety. As very small angles are being observed and as accuracy is desired, always take the mean of the readings both "on and off" the arc. This eliminates any sextant index error. The height of lighthouse and headlands—above high water—are shown on charts and in light lists.

Position by Vertical Sextant Angle

For the benefit of those who are not familiar with this method of fixing a ship's position, it should be explained that if the height of any object is known, its distance may at once be found in the daytime by taking a vertical sextant angle of it. If at the same time the bearing of the object is taken by compass the ship's position is determined. This gives a fairly accurate fix and should, when practicable, be used in preference to other methods when in tidal waters, as it gives the ship's position without delay, and without the possibility of error which may occur when using the four point and other running fixes. In modern navigation whenever possible, in the daytime, especially when passing abeam of an object (i e., 90° from ship's course), always fix the ship's position by taking a vertical sextant angle of the object.

In practical navigation Tables 9 and 10 in Bowditch are used. Table 9 is used when the distance off is esti-

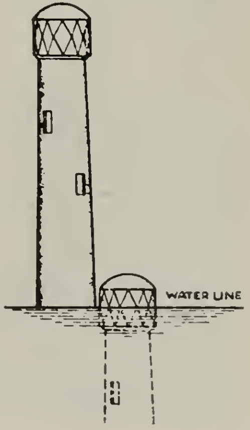


Fig. 19. Taking the vertical sextant angle.

mated to be less than 5 miles, and Table 10 when the distance off is estimated to be more than 5 miles. These tables are simply a series of columns under headings for various heights of objects on shore. In each column under the heading for the height of the object will be found a series of sextant angles, and at the outer edge of the table will be found the distance off comparing to the sextant angle. In many cases some mental interpolation is necessary, but as a rule the distance off can be found in using these tables without the use of pencil and paper.

In practice, if you have no tables, an excellent rough method is: Multiply the height of the object by 0.565, convert the sextant angle into minutes, and divide. The result will be the distance off in miles and tenths of miles. This rough method is practicable only to to five miles, but it is very simple.

The Vertical Danger Angle

To avoid sunken rocks and shoals, or other dangerous obstructions which are marked on the chart, the navigator may use what is known as a *danger angle.* The vertical danger angle requires a well-charted object the height of which is known. The angle which is to be used must be obtained before entering the dangerous area. Use of the vertical danger angle is shown in Figure 20.

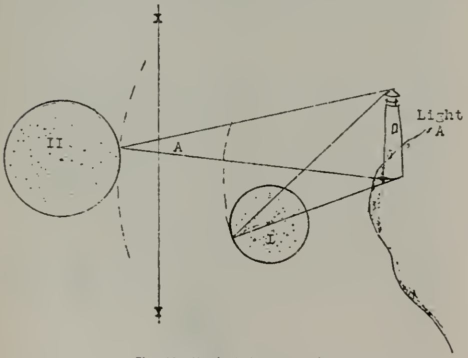


Fig. 20. Vertical danger angle.

Assume the ship to be on a course XY, and that the navigator wants to pass between shoal areas I and II, and in doing so must keep clear of both shoals. Light A is shown on the chart to be 100 feet in height. By measuring the distance from the base of Light A to clear shoal area I, it is found to be one mile. By entering Table 9 (Bowditch) the sextant angle necessary to keep the ship one mile from Light A is found to be 0° 57′. The navigator then measures the distance from the base of Light A to clear shoal area II, which is found to be one and one-half miles. The sextant angle necessary to keep the ship one and one-half miles from Light A is found to be 0° 38′. Therefore, just as long as his sextant angle does not become greater than 0° 57′, or less than 0° 38′, he will keep clear of both shoals.

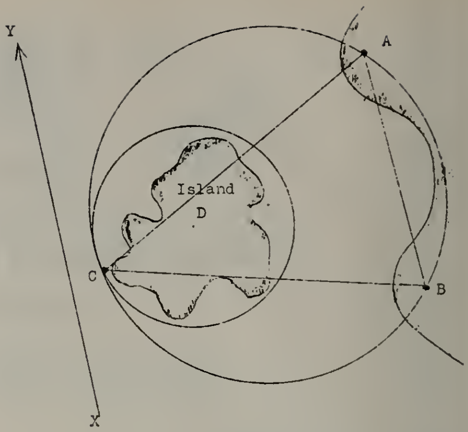


Fig. 21. Fix by use of horizontal sextant angles and three-around protractor.

The Horizontal Sextant Angle

To determine position by means of the horizontal sextant angle three objects are required, which are plainly marked on the chart and the horizontal angle measured between the center object and the object on either side. To take the horizontal sextant angle between two objects, hold the sextant horizontally (flat), mirrors upwards, and bring the reflection of the right-hand object directly below the left-hand object, when the left-hand object is seen through the plain portion of the horizon glass. To pick up the reflection of the right-hand object the index arm should be set at zero. The observer looks directly towards the left-hand object, and by moving the index arm to the center of the arc gradually brings the right-hand object to the point where it will be superimposed on the object to the left. The angle is then read.

Perhaps the best method in plotting horizontal sextant angles is to use a three-armed protractor. Select three objects whose positions are accurately given on the chart. With a sextant measure the angles between the center object and the objects to the right and left. The protractor should be placed on the chart with the fixed arm away from the navigator, the right movable arm set for the right angle and the left movable arm for the left angle. Verify the settings and clamp the arms. Place the protractor on the chart with its center about the estimated position of the ship, with the straight edge of the fixed arm passing through the plotted position of the center object. Move the protractor about until the straight edges of the right and left arms pass through the plotted positions of the right and left objects. The center of the protractor is now right over the position of the ship at the time the sextant angles were taken. Mark this position on the chart.

The three-armed protractor has the advantage of giving chart positions which are independent of compass errors. Figure 21 illustrates the method of determining

(Please turn to page 144)

On the Ways—
SHIPS IN THE MAKING

Pacific Coast Shipbuilding

The casual reader of the press these days is very apt to conclude as he did in 1920 that shipbuilding is dead. In fact this assumption is more or less common even in the industrial departments of our Chambers of Commerce. This assumption is very far from the fact for shipbuilding is not dead but is going through a period of adjustment and in that period is fairly busy as compared with normal prewar shipbuilding.

On the Pacific Coast a casual survey of the shipyards indicates as of December 1, 1946, the following partial list of contracts under way:

		Gross tons
Bethlehem Steel Co. Alameda Shipyard	2 Passenger Liners 573′ x 75′ 6″ x 43′ 6″ Turbo-Electric 20,500 shp American President Lines (both launched)	Total 30,900
Bellingham Iron Works	14 Steel Purse Seiners 76′ 6″ x 22′ x 10′ 11″ 250 shp diesel U. S. Treasury Department	Total 1,610
	5 Wood Purse Seiners same dimensions U. S. Treasury Department	Total 575
Consolidated Steel Corp.	2 Steel Tuna Clippers 115′ x 28′ x 14′ 6″ 900 shp diesel	Total 680
Northwest Marine Iron Works	1 Stern Wheel Tow Boat 186′ x 42′ x 9′ Steam reciprocating 1625 shp	Total 750
Oregon Shipbuilding Corporation	3 Passenger and Cargo Steamers 436′ 6″ x 62′ x 38′ U.S.M.C.-Alcoa Steamship Co.	Total 24,600
Pacific Boatbuilding Co.	5 Steel Purse Seiners 78′ 9¾″ x 22′ x 11′ 2″ 240 shp diesel U. S. Treasury Department	Total 600
	3 Wood Purse Seiners	Total 330
Tacoma Boatbuilding Co.	5 Steel Purse Seiners same as above	Total 600
	4 Wood Purse Seiners	Total 440
United Concrete Pipe Co.	2 Tuna Clippers 840 shp diesel	Total 685
Birchfield Boiler Works	4 Tuna Clippers Diesel engine	Total 1,300
Gunderson Bros. Engineering Corp., Portland, Oregon	1 Kelp Harvester	Total 250
Total Vessels	51	Total tons 63,320

This compilation does not include every fishing vessel under construction nor does it indicate any of the naval work in progress.

An interesting feature of the present situation is noticed in the report of the California Labor Commissioner which shows that during November employment in the privately operated shipyards of the San Francisco Bay district increased 4 per cent or 400 men. That indicates 10,000 employees still busy in the privately owned shipyards of this district, and means that including the Navy shipyard establishments on the Pacific Coast there are from 35,000 to 40,000 employees still working in shipyards on the West Coast.

Those who knew the lean years prior to 1939 will agree that such figures indicate a continuing shipyard activity far in excess of what was then considered normal. With careful planning by management and the cooperation of labor, there should be a very respectable ship construction, ship repair, ship conversion, and ship scrapping industry on the Pacific Coast, and this industry should have a healthy growth as Pacific world trade develops.

Barges Delivered Ahead of Schedule

Use of an assembly line designed specifically for the construction of harbor craft enabled Bethlehem Steel Company's Staten Island Yard to deliver two of four barges being built for M. & J. Tracy Company, December 12, or eight days earlier than the original schedule date. Keels for the barges were laid less than one month ago.

Immediately after launching of the first two units, keels for the second two barges will be laid on the same building ways. It is expected that these craft will be ready for delivery a month later.

These four barges are of the hopper-type for coal and incorporate new features, including an improved method of bottom framing on which a Bethlehem patent is now pending. They are 146 feet long, 38 feet beam and 17 feet 6 inches deep, with a capacity of 2,050 long tons.

Two barges of the same type also

The hydraulic dredge Papoose, owned by the Hydraulic Dredging Company of Oakland, California, on the drydock at Bethlehem's San Francisco yard for re-installation of the 50-foot section in her dredging ladder in preparation for a contract to dredge for new berthing facilities at the San Francisco naval shipyard at Hunter's Point.

will be built for the Berwind-White Coal Mining Company. In addition, two dump scows with a length of 223 feet 6 inches, beam of 44 feet, depth of 15 feet and capacity of 1,500 cubic yards, are scheduled to be built for the Great Lakes Dredge & Dock Company.

Famous Liner Sold To Portugese

American President Lines during December sold the veteran transpacific and Round-the-World passenger-cargo liner President Johnson to Portuguese interests who have arranged to operate the vessel under Panama registry in an immigration service from Portugal and Mediterranean ports to Brazil and Argentina.

Bids were called for reconditioning and conversion of the vessel resulting in a low bid from General Engineering and Dry Dock Company. At this writing contract had not been let. Cost will be in the neighborhood of $400,000.

President Johnson, a troop carrier in two world wars, is the former Pacific Mail liner Manchuria. Built at the New York Shipbuilding Company yard, Camden, New Jersey, in 1904, she has a length of 600 feet b.p., a beam of 65′ 3″, a molded depth of 43′ 4″, a gross measurement of 16,111 tons, and is propelled by twin screws each driven by a quadruple expansion steam engine with cylinder diameters 30″-43″-63″-89″ and a stroke of 60″.

From 1904 to 1914 Manchuria was operated in the transpacific service of the old Pacific Mail and became one of the most popular liners in that service. Transferred to the International Mercantile Marine, she was operated by them as a transport throughout World War I. After that war, she operated in the New York-Hamburg service and later was transferred to the Panama Pacific line in the intercoastal passenger and cargo service, New York-San Francisco. In 1929, Manchuria was acquired by the Dollar interests who changed her name to President Johnson and placed her in their Round-the-World Service.

The President Johnson was one of the few vessels which served through two world wars. Her service in World War II was particularly distinguished. In January, 1941, she was loaded with 18,000 tons of cargo destined for the Burma Road via Rangoon. She returned by way of Straits Settlements, Manila and Hong Kong, Baltimore and New York, with a full load of desperately needed rubber, tin and other strategic materials. She was then chartered by the British Ministry of Ships for a voyage to India via Capetown, bring home another full cargo of critical raw materials from the Straits Settlements and Manila to the East Coast.

In November, 1941, the President Johnson was chartered by the United States Army Transport Service and after proper conversion, she sailed from San Francisco December 5, 1941 (two days before Pearl Harbor) for Manila loaded with Army personnel. From then on she continued to operate throughout World War II as a troop transport in the Pacific, during which service she transported more than 30,000 troops to battle zones overseas.

Famous liner, President Johnson, sold to the Portugese.

Queen Elizabeth Serviced Prior to Sailing

A Texaco truck supplies lubricating oil to the R.M.S. Queen Elizabeth at her dock at Southampton, England, prior to her maiden voyage as a passenger ship. Texaco Regal Oil "C" has been used exclusively in the main generators of the giant vessel since she left the builder's yard and throughout her war service.

Bethlehem's Busy San Francisco Yard

The veritable forest of ships' masts, etched against a background of cranes, floating drydocks and other shipyard facilities, part of which is shown in our illustration, indicates the diversification and extent of ship repair activity now going on at Bethlehem Steel Company's San Francisco Yard.

At the left, in drydock No. 1, is the SS Fort Moultrie, a T-3 tanker operated by the Keystone Shipping Co., which is being restored to service from layup. In the center, on drydock No. 4, is the M/V Carrick Bend, freighter undergoing routine drydocking and painting. Moored to the wharf at the right of the Carrick Bend is SS W. H. Berg, tanker owned and operated by the Standard Oil Company, which came to Bethlehem for drydocking and voyage repairs. Behind the W. H. Berg, with lifeboats visible, is the SS Marine Phoenix, which is being converted from a trooper to a passenger vessel to be operated by Matson Navigation Co. in service to Australia.

Not shown in the photograph, but also at Bethlehem's San Francisco Yard for repairs, are nine other vessels.

New Cunard-White Star passenger cargo liner Media

New Cunard White Star Liner

Sponsored by Mrs. Alfred Barnes, wife of the British Minister of Transport, the Media was launched in John Brown's Shipyard, Clydebank, Scotland, at approximately 2:40 p. m., December 12.

Media is built to comfortably accommodate about 250 passengers in one class. She is 540 feet in length, has a breadth of 70 feet, a gross tonnage of 14,000, and is the second new liner to be launched under the Cunard White Star Line's postwar building program, and will enter transatlantic service in the summer of 1947.

On the promenade deck a lounge, smoking room, writing room and cocktail bar are provided for passengers. The lounge is two decks in height and is equipped with a full-size stage and screen for showing motion pictures. The dining room, located on "B" deck, extends the full width of the ship. Air conditioning covers all the public rooms.

Offering considerable space for passenger recreation and relaxation, the ship has a glass-enclosed promenade deck, and open sports and bridge decks. Her cabins are all equipped with baths or showers.

Special attention has been given to providing comfortable accommodations for the officers and crew of the ship. The entire boat deck has been set aside as Officer's Country, and the crew is quartered on a lower deck in cabins of two to five berths. Lounges and recreation space are available for all the ship's company.

Media will carry general cargo amounting to about 7,000 tons, including refrigerated freight in special insulated compartments.

Propelled by two sets of double reduction geared turbines, she will have a service speed of 17 knots. Her auxiliary machinery is almost entirely driven by electricity, supplied by four diesel generators.

Media is the first Cunard White Star vessel built by John Brown Ltd. since Queen Elizabeth was launched from the same yard in 1938. A sister to the Media is presently under construction at Harland and Wolff's, Belfast.

Launching of the President Wilson

Mrs. E. Russell Lutz, wife of executive vice president of American President Lines, at the launching of the SS President Wilson, November 24, 1946.

Running LIGHTS

WHO'S WHO AFLOAT AND ASHORE

Edited by B. H. Boynton

The Cadet-Midshipmen held their formal dance of 1946. This dance was sponsored by the Propeller Club, Student Port of the U. S. Merchant Marine Cadet School, San Mateo, and was held in Matson Hall on the Cadet School grounds.

San Mateo Cadet-Midshipmen Have Resumed Studies After Holidays

Cadet-Midshipmen of the U. S. Merchant Marine Cadet School, San Mateo, California, fresh from holiday leave, have settled down once again to the rigorous routine of training to become ship's officers in the U. S. Merchant Marine. However, after study hours, many tall holiday yarns of the 225 Cadets have been swapped among the captains-to-be of the future.

Christmas Eve was moved up to the evening of December 19 as far as the Cadet-Midshipmen were concerned. On that evening the annual Christmas party was held at the school, with Santa and all on hand 'round the huge Christmas Tree. At this time the newly formed Glee Club of Cadet-Midshipmen made their appearance with appropriate carols. The Cadet School orchestra rounded out the musical portion of the evening party.

The start of holiday leave was December 20. One hundred thirty Cadet-Midshipmen from homes in Eastern cities chartered five planes for their transcontinental flight and were home in short order. They were not required to report back to the station until late January 1 and all reports received by Captain Arthur O. Brady, USMS, superintendent, indicate that everyone enjoyed his holiday to the utmost.

Highlighted in the agenda of the annual meetings of the Society of N.A.M.E.'s is the banquet in great ballroom of the Waldorf-Astoria, New York. San Francisco's marine fraternity had a special interest in this year's banquet because on that occasion an old San Franciscan, James A. Thomson, formerly Superintendent of the U. S. Army Transport Docks at Fort Mason, was awarded a Fifty-Year Membership Scroll. Thomson joined the N.A.M.E.'s in 1896. See pages 52 and 95.

Society of Naval Architects and Marine Engineers

At the N.A.M.E. Left to right: William S. Newell, president of the Society of Naval Architects and Marine Engineers, and Vice Admiral E. L. Cochrane, U S N, president-elect.

Vice Admiral Edward L. Cochrane, U.S.N., chief of the Bureau of Ships of the Navy during the war period, and now chief of the Office of Materiel, was elected President of The Society of Naval Architects and Marine Engineers at the 54th Annual Meeting of the Society at the Waldorf-Astoria, New York.

William S. Newell, president of the Society for the past two years and president of Bath Iron Works Corporation, was elected an Honorary Member of the Society for life.

Captain Wilbur N. Landers, U.S. N., who was attached to the New York Navy Yard during the war, was elected Secretary of the Society for a one-year term.

J. H. King, secretary of the Society for many years and vice president of the Babcock and Wilcox Company, was elected treasurer for a one-year term.

Four vice presidents were elected for the term ending December 31, 1949, as follows: Arthur B. Homer, president, Bethlehem Steel Company; John E. Burkhardt, technical manager, Bethlehem Steel Company, Shipbuilding Division; Walter C. Hemmingway, vice president and general manager, Federal Shipbuilding and Dry Dock Company, and J. Lewis Luckenbach, president of the American Bureau of Shipping.

William Francis Gibbs was awarded the David W. Taylor Medal which is awarded by the Society for notable achievement in Naval Architecture and Marine Engineering. Mr. Gibbs has had a long and distinguished career as a designer of naval and merchant vessels.

The Linnard Prize was awarded jointly to Harold F. Robinson, naval architect, Bethlehem Steel Company, Shipbuilding Division, and Eugene P. Worthen, chief engineer of the same company, for their paper presented at the Annual Meeting of the Society in 1945 entitled: "The Ore Carrier S. S. Venore."

A new award recently established and presented for the first time this year designated, "The President's Award," went to Dr. K. S. M. Davidson, Professor of Mechanical Engineering and Director of the Experimental Towing Tank, Stevens Institute of Technology, for his paper entitled: "Seaworthiness with Special Reference to Bilge Keels," presented before a meeting of the local Philadelphia Section of the Society in 1945.

Fifty-year Membership Scrolls were presented to: Clinton H. Crane, famous yachtsman, and president of the St. Joseph Lead Company; Charles F. Bailey, Engineering Director (Ret.), Newport News Shipbuilding and Dry Dock Company; James A. Thompson, of San Francisco, for many years superintendent of the U. S. Army Transport docks, Fort Mason, San Francisco; and Miguel Rebolledo, naval architest, Mexican Navy.

Representing members and associate members of the Society, the following council members were elected for the term ending December 31, 1949: Vice Admiral Earle W. Mills, U.S.N., recently appointed Chief of the Bureau of Ships of the United States Navy: .William E. Blewett, Jr., vice president, Newport News Shipbuilding and Dry Dock Company; James L. Bates, director of Technical Division. United States Maritime Commission; John W. Hudson, naval architect, Sun Shipbuilding and Dry Dock Company; Roy S. Campbell, president and general manager, New York Shipbuilding Corporation; and Richard H. Tingey, assistant technical manager, Bethlehem Steel Company, Shipbuilding Division.

Council members representing associate members of the Society, who were elected for the term ending December 31, 1949, were: Major General John M. Franklin, president, United States Lines, Alton B. Sharp, president, Eastern Steamship Lines; and David W. Niven, formerly head of the Federal and Marine Division, General Electric Company, now retired.

O. B. Whitaker, head of the Marine Division, Sperry Gyroscope Company, was elected Assistant Treasurer of the Society, and Arlo Wilson was re-elected as Assistant Secretary of the organization.

Proposed New Officers of the Port of San Francisco Propeller Club

◄ W. M. Laughton, district manager of Bethlehem's West Coast Yards, new president of Propeller Club, San Francisco.

Lewis A. Lapham, assistant to the President, American-Hawaiian Steamship Company, and new first vice president of Propeller Club, San Francisco. ►

The Port of San Francisco, Propeller Club of the United States, nominating committee, appointed by the club's president, Joseph J. Geary, and consisting of Messrs. Joseph A. Moore, Jr., chairman, Fred L. Doelker, Hugh Gallagher, A. B. Poole and Chas. L. Wheeler, have proposed the following for officers and new board members to serve the club during the year 1947:

For President: W. Miller Laughton
1st Vice President: Lewis Lapham
2nd Vice President: J. J. Coney
3rd Vice President: Edward H. Harms
Secretary - Treasurer: Eugene F. Hoffman
Asst. Secty.-Treas.: Carl McDowell

For Board of Governors for the next three years: Joseph J. Geary, C. M. LeCount, D. N. Lillevand, Vincent P. McMurdo, and Hamilton B. Perrin. Holdover Governors include: E. H. Harms, Earl Livingston, E. Russell Lutz, Joseph A. Moore, Jr., George E. Swett, Dearborn Clark, J. J. Coney, Gregory Harrison, W. Miller Laughton and K. C. Tripp.

The annual meeting, election and installation of officers was held January 15, 1947.

W. M. Laughton, district manager of Bethlehem's West Coast Yards, has been associated with Bethlehem organization for more than 20 years, having begun as a machinist's helper in the Company's steel plant at Sparrows Point, Md. He has served in various capacities in the Moore plant in Elizabethport, N. J., the shipbuilding office of the Company in Bethlehem, Pa., and in the shipbuilding yard in Quincy, Mass.

In 1936 Mr. Laughton was transferred to the San Francisco shipyard and on June 22, 1937, he was made general superintendent. On Oct. 23, 1939, he was appointed assistant general manager of the West Coast yards, and on February 9, 1944, manager of the San Francisco yard. On February 9, 1944, Mr. Laughton was made general manager of the associated company, Bethlehem-Alameda Shipyard, Inc., at whose yard in Alameda are now being turned out the largest commercial vessels built on the Coast.

On December 1, 1944, Mr. Laughton was appointed general manager of San Francisco, Bethlehem - Alameda Shipyard, Inc., and San Pedro yards of its Shipbuilding Division.

NATIONAL OFFICERS OF THE PROPELLER CLUB OF THE UNITED STATES FOR 1946-1947

At the 20th Annual Convention held at the Waldorf-Astoria Hotel, New York, the above were elected officers of the National Propeller Club. Left to right: Commander Harold J. Harding, USNR, National Secretary; Lewis D. Parmelee, president, Atlantic, Gulf & West Indies Steamship Co., National President; Lt. Comdr. Arthur M. Tode, USN (Ret.), Honorary President; Joseph H. Godwin, The Texas Company, National Treasurer.

General Electric Award Given George Barr in San Francisco

Allan G. Jones (left), Pacific District manager of the General Electric Apparatus Dept., congratulates George Barr of the Marine Section, who received the Chas. A. Coffin Award for outstanding services in marine installations in the Bay Area.

George Barr, widely known General Electric marine superintendent, has been given the company's highest recognition, the Charles A. Coffin Award, for his outstanding work during World War II in supervising installation and repair of turbines and gears in both Navy and marine ships that were built in or came to the Bay Area for repairs. Allan G. Jones, Pacific District manager of the Apparatus Department, in presenting the award on behalf of the company, commended Mr. Barr for his selfless devotion in keeping uppermost the welfare of his country at all times.

The San Francisco engineering division faced the largest supervision of installation jobs in its history back in July '41—namely, the installation of the main propulsion turbines, gears, turbo-generator sets, and motors and auxiliary turbo-generator sets for U. S. Naval vessels and U. S. Maritime Commission vessels undergoing construction in Bay Area shipyards. As marine superintendent, Barr was responsible for this work.

The shortage of engineers required training a nontechnical crew but, because of Barr's ability and prestige, he was able to attract able and competent men. His selection and training of a group of 25 speaks for itself in the accomplishments made—*i. e.,* the installation of main propulsion equipment aggregating a total of 2,603,500 hp on a total of 320 ships. In addition, they supervised the installation of auxiliary turbo-generator sets aggregating 134,350 kw.

As the tempo of Pacific warfare increased, the Bay Area became the home port of a great fleet. The job of making untold repairs on many and varied ships in record time presented a major problem. George Barr sensed that the repair load would become greater and greater, and laid plans. He trained his installation supervisors as repair supervisors, so that they in turn could supervise repairs, reconditioning, alterations and additions to all classes of naval and merchant vessels. In 1942, repairs were supervised on four ships—in 1945, 377 were put back on the seas. The maximum load was reached in June '45 when 51 vessels were supervised. And Barr constantly developed new and better methods for installing equipment quickly and correctly.

Mr. Barr won the admiration, respect and gratitude of high officials in the U. S. Navy, U.S.M.S., W.S.A., and many shipyards, both Navy and private, in the Bay Area, the ship operators, and—by no means the least—the respect and affection of his own installation and repair supervisors.

Rear Admiral G. C. Klein, Commander of the Mare Island Shipyard, wrote: "Mr. Barr, throughout the entire war and the demobilization period . . . has exhibited the greatest interest in our problems and has rendered sound engineering advice which has saved us valuable time and manpower in accomplishing our mission. . . . We could count on him regardless of the time or the day. . . . The Navy can pay no higher compliment than to express to Mr. Barr its gratitude and state that we consider he has earned a Navy 'Well Done.' "

Born in Paisley, Scotland, he had his first training in a technical academy there in steam and applied mechanics. After seven years of drafting and machine shop apprenticeship, he was marine engineer with the British India Steam Navigation Company. In 1907 he came to General Electric in Schenectady where he started as a machinist. For the past 28 years, he has been with the company in the San Francisco engineering division as turbine supervisor and marine superintendent. Recently, he became part of the Federal Marine section as contact man for the marine fraternity. He lives at 1285 Hamilton Avenue, Palo Alto, California.

Building exterior on Harrison Street.

Nordberg's New Pacific Coast Headquarters

The Nordberg Manufacturing Company recently opened new headquarters at 674 Harrison Street, San Francisco, from which will be served the Pacific Coast and Alaskan territory, including the dealers in Hawaii, the Philippines, and the Orient.

The building covers an area of 11,000 square feet and houses the Administration offices, and facilities for the staff to handle sales, service and spare parts. The stock housed here consists of all parts required for emergency replacements, as well as regular spare parts used in the maintenance of the various classes of Nordberg engines, operating in the different types of ships in Pacific waters. Space is also available for storage of similar spare parts and complete engines of the new line of smaller Nordberg four-cycle units.

The office will provide headquarters for the Pacific Coast dealer organization which will market the new small engine line, and render service to the users of this new type equipment.

Charles G. Cox is in charge of all Pacific Coast territory, and George Lienhard is chief installation and service engineer.

◄ Charles G. Cox, Pacific Coast manager.

► George Lienhard, installation and service engineer.

William A. Ross, president of Columbia Steel Co.

Columbia Steel Buys Consolidated's Assets

William A. Ross, president of Columbia Steel Company, the Pacific Coast subsidiary of United States Steel Corporation, announces that Columbia Steel had concluded an arrangement to purchase the principal fixed assets and inventories and work in process of Consolidated Steel Corporation, a California Corporation, subject to approval of this sale by the stockholders of Consolidated Steel Corporation. The announced price was $8,293,319.

Consolidated Steel Corporation is engaged in the fabrication and erection of structural steel, plate and sheet products, its major plants being located in the Los Angeles and San Francisco areas.

The fabricating operations of Consolidated on the West Coast should provide a market for a considerable tonnage of plates, sheets and structural steel to be produced at the steel plant at Geneva, Utah, recently purchased from the Government by United States Steel Corporation. This should be helpful in enabling the Geneva Plant to be continued in operation as a peacetime project. Large plate and structural steel capacities, in excess of those called for by the normal needs of the Far West, were installed initially at Geneva by the Government to meet the requirements of its wartime shipbuilding programs on the Pacific Coast. One of the peacetime problems of the Geneva Plant is how to utilize advantageously these large capacities.

Alden G. Roach, president Consolidated Steel Corp.

At the present time United States Steel Corporation has no steel fabricating operations on the Pacific Coast, other than the drum and container plants of United States Steel Products Company at Los Angeles and Alameda, California.

President A. G. Roach, for Consolidated, makes a similar announcement, adding that if the sale goes through Consolidated will be dissolved and liquidated.

Personalities in the Shipping World

◄

H. V. Walker, assistant to the president, and traffic manager of Pacific Transport Lines in San Francisco.

►

The Interior Design Division of George G. Sharp is honored to have in its ranks the first woman to be elected to the Society of Naval Architects and Marine Engineers. Miss Jo Anne Steane has worked with color, paints, fabrics and other phases of marine interior design under the expert direction of Jack Heaney. She was notified that she had been elected to the status of a Junior Member shortly after her return from the Ingalls Yards at Pascagoula, Mississippi, where she inspected the interiors of the Sharp - Designed S.S. Del Norte, a luxurious, completely postwar passenger cargo vessel which has just been delivered to the Mississippi Shipping Company of New Orleans.

▲ James Brodie, Pacific Coast Representative of the Stan Line of London (center), guest of its Southern California Agency, Transmarine Navigation Corp. Left is Max Linder, president, and right is R. C. Stevens, executive vice president.

◄ At left, Guest Speaker Donald Nelson and Max Linder, Jr., president of Junior Foreign Trade Association of Southern California.

Donald Nelson and Maverick Speak At L. A. Foreign Trade Meeting

"We can't be prosperous and we can't have world peace without world trade," said Donald Nelson last month to 200 Los Angeles shipping people and traders; and Maury Maverick, whom he introduced at the annual banquet of the Junior Foreign Trade Association of Southern California, expressed the same belief. And they might well have said, with equal conviction, "We can't have *shipping* without world trade!"

The Coast will have as part of its development the development of world trade, for the Pacific countries are our natural customers, said Nelson, and we should seek "natural" business arrangements with these countries to develop their industry and resources for more trade and improved living standards for ourselves.

Maury Maverick, apologizing for the political nature of the subject, pointed out the pressure that will be in and on the new Congress to abolish the International Trade Organization and return to the protective tariff.

The speakers were introduced by President Max Linder, Jr., and toastmaster Russell Goode at the first postwar banquet of the Association. This group was active before the war, and is now embarked on an aggressive postwar program. Others responsible for the success of the event were James Louden, Jr., William Ziegler, Brae Loveless, Frans Benson, and Harry Lawrence.

Committeeman James Loudon, Jr., of James Loudon & Co., Custom's Brokers, forms a family portrait with his mother and dad.

◄

Below, left: C. F. Yenney (left), district manager, Transpacific Transportation Co., carries on with S. M. Campbell, F. de Berna, Stanley Lindo, W. D. Rogers, H. J. Hayes, all of Transpacific except Mr. Lindo, who is an exporter.

Los Angeles Matson offices were represented by, left to right: E. R. Gordon, J. S. Vernay, Jr., and Paul W. Carter; Fred E. Laughlin was also present.

▼

William Schorn, architect, Marine Interior Designer, formerly Department of Interior Design, U. S. Maritime Commission.

Shoreside Personalities

WILLIAM F. SCHORN, of 198 Broadway, New York City, was recently a visitor in San Francisco in connection with the interior design of the P-2 liners for the American President Lines.

Schorn was formerly Chief of the Marine Interior Design Section of the U. S. Maritime Commission. Prior to that he was engaged in private practice as an architect on interior design.

He is responsible for the interior design on many of the passenger ships of recent construction in the United States, and is currently engaged on the Uruguay, Brazil, Argentina and the Washington. The design of the interiors on the six reconverted C-3's being completed in the Federal Yard at Kearny for the American South African Line are also from his board.

* * *

MARINE INSTRUMENT CHANGE: The Marine Instrument Company of 1539 Folsom Street, San Francisco, is now being operated by Charles H. Peabody. Joe Benoit has severed his connection with the firm.

* * *

PACIFIC COAST ENGINEERING COMPANY, of Alameda, California, C. H. Ramsden, president, has announced the appointment of Bodon Company, Pasadena, as Southern California representative. The Bodon Company, headed by R. F. Hurt and D. C. Gafney, will handle the complete line of Pacific Coast Engineering Company standard products and will promote the engineering design and manufacturing services of the company to all industry in the area.

* * *

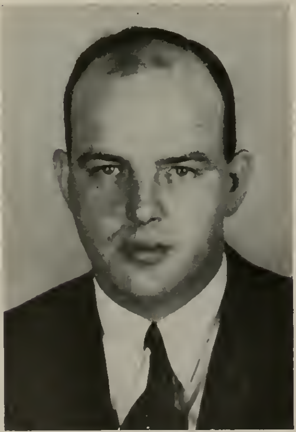
MARINE SALES MANAGER FOR GENERAL PETROLEUM

Appointment of Ragnar "Rags" Giske, as manager of marine sales for the Washington Division of the General Petroleum Corporation is announced by Clarence S. Beesemyer, vice-president in charge of marketing.

Mr. Giske succeeds Carl J. Waage, who passed away in Seattle on November 17.

The new marine sales chief, a graduate of the University of Washington, where he majored in foreign trade and water transportation, joined General Petroleum in 1934 as a clerk at Tacoma. Subsequently he specialized in lubrication sales and joined the marine sales department as a salesman in 1939. All of his service has been in the northwest except for the period from 1944 to 1946 when he was stationed in Los Angeles.

Ragnar Giske, manager of marine sales of Washington Division of General Petroleum.



James W. Speer, directing Cargoaire Engineering Corp. interests in Washington, D. C.

CARGOCAIRE ENGINEERING CORPORATION recently opened an office at 726 Jackson Place N.W., Washington, D. C., under the direction of James W. Speer, as was announced in the December issue of PACIFIC MARINE REVIEW. In addition to Cargocaire, Mr. Speer will also represent the divisions of Cargocaire, Carswell Marine Associates and The Landley Company, in the Washington district.

Obituary

JACK YOUNG PASSES: Jack Young, regional manager of the Portland area of the Repair and Maintenance Department for the War Shipping Administration, passed away on November 22. Before going to that city in March of 1945, he was assistant to the manager of the similar department of the WSA in San Francisco.

Born in England, 68 years ago, he came to the U. S. A. when 15 years of age, and spent most of his life in the maritime industry on the Pacific Coast. At different periods of his career he served as chief engineer of the Matson Company vessels, port engineer for the Nelson Line, and also with the Struthers and Barry Company.

He was a fine fellow and held in the highest esteem by all who knew him.

Captain Lindley Winser, Marine Division, Mackay Radio and Telegraph Company.

Captain Winser Manages Mackay Radio's Marine Station

The appointment of Captain Lindley Winser, U.S.N.R., as manager of WSL, key coastal marine radiotelegraph station of the Mackay Radio and Telegraph Company is announced by E. H. Price, vice president and general manager of the Marine Division of Mackay Radio, WSL. This station, one of Mackay Radio's most powerful links in its shore-to-ship communications operations, is located at Amagansett, Long Island.

Captain Winser, Navy veteran of World War I, was called to active duty in June, 1940, and served as Communications Officer on the U. S. S. Utah until it was sunk at Pearl Harbor in December, 1941. Following Pearl Harbor he was stationed successively at Tutuila, Samoa, Guadalcanal, and the Eleventh Naval District at San Diego, California. Upon his release from the Navy in October, 1945, Captain Winser served as district manager for Mackay Radio and Telegraph in Los Angeles for twelve months. Prior to entering Naval service in 1940, he had been associated with Mackay Radio and Telegraph, and its predecessor, the Federal Telegraph Company, in Los Angeles for eighteen years.

Mackay Radio and Telegaph is an operating unit in the American Cable & Radio Corporation system, which is affiliated with the worldwide International Telephone and Telegraph Corporation.

A British Expert on Cargo Stowage

Sidney J. Duly, world famous British authority on the stowage of ships' cargoes, left recently for England after two months in this country observing shipping practices in the handling and storage of cargo. He was quite impressed during his survey with the great strides made in this field since his last visit.

Sydney J. Duly

After graduating with honors from Cambridge University and the University of Berlin, Mr. Duly was engaged as a consultant by British shipping interests and designed and operated the general physics, chemistry and microscopy laboratories that were erected by the City of London College

Awarded the Mitchell Research Fellowship in 1926 to investigate moisture damage aboard merchant vessels, he won the Royal Society of Arts Silver Medal for his discoveries. In 1937, he was appointed to the Leverhulme Fellowship for the investigation of storage conditions aboard ships.

During the war, Mr. Duly served as a technical advisor to the Royal Air Force from 1940 until 1945.

While in this country, Mr. Duly collaborated with O. D. Colvin, president of the Cargocaire Engineering Corporation, on a technical paper entitled "Control of Humidity in Cargo Spaces on Board Ship." that will be presented in February 1947 before the North East Coast Institute of Engineers and Shipowners at Newcastle on Tyne, England.

He is a Director of Cargocaire Ltd., a British company formed early in 1946 for the manufacture of Cargocaire dehumidification equipment in Great Britain. Since the formation of this company, three major British shipping lines, Blue Star, Ltd., Furness Withy & Co., Ltd., and the Peninsular and Oriental Steam Navigation Co. have contracted for the installation of Cargocaire in many of their vessels now under construction.

Bethlehem Pacific Coast Steel Public Relations Head

Willard S. Briscoe has been made manager of Publications, in charge of a newly created Public Relations Department of Bethlehem Pacific Coast Steel Corp.

Detroit Diesel Engine Appointments

The appointment of John C. Campbell as manager of industrial engine sales and of James W. Brown as advertising manager was announced recently by V. C. Genn, general sales manager for the Detroit Diesel Engine Division of General Motors. The appointments were made by Mr. Genn at a sales conference held recently in Detroit where plans were laid for activities during 1947.

Mr. Campbell, who will now direct industrial sales of the GM Series 71 diesel engine through Detroit Diesel's distributors and dealers, brings to his new job a wide experience in many phases of the business. Following his graduation from the University of Detroit with an engineering degree, he spent several years with the Wright Austin Company and with the Frigidaire Division of General Motors. He joined Detroit Diesel in 1942 as a member of the Sales Department, studying the wide uses of the GM Series 71 engine in industrial applications. Since 1945, Mr. Campbell has been in charge of Advertising and Sales Promotion activities for the company.

Mr. Brown, who now takes over as advertising manager, has been directly connected with advertising and publication work since his graduation from Yale in 1927. He spent several years on the advertising staffs of leading publications in Cleveland, Memphis, and Dallas, and for the past year has held the position of product news manager for Detroit Diesel. Mr. Brown, who is well known as the author of "What Do GM Diesels Do?", will continue to be in charge of product news for the company.

Left to right: J. W. Brown, and J. C. Campbell, Detroit Diesel Engine Division of General Motors.

Moulton and Buist Named Turco Sales Chiefs

Appointment of L. H. Moulton to the post of national sales director and D. T. Buist, assistant national sales director, was announced recently by Ray Sanders, vice president and general manager, Turco Products, Inc. Their headquarters will be the firm's main offices in Los Angeles.

Fifteen years' experience in the selling of Turco's broad chemical line gives Lou Moulton excellent qualifications to direct the nationwide sales-service staff.

Dan Buist, assistant national sales director, joined Turco in 1936 as a specialist with 20 years' experience in the automotive field. Transferred to the Aviation Division in 1939, he was promoted to district sales manager in 1943, and Western Zone sales manager in 1944.

During the past two decades Turco has established four factories in Los Angeles, Houston, and Chicago. Selling direct to the industrial consumer, Turco maintains 65 warehouses and sales offices staffed with trained technical service men.

Left to right: Lou Moulton and Dan Buist, chiefs of Turco Sales Division.

Southern California Office of George S. Lacy Company

The George S. Lacy Company of San Francisco recently announced the opening of their Southern California office at 526 South San Pedro Street, Los Angeles. Clarence F. Herrmann, former sales director of Wilcox Crittenden & Company, Inc., for 20 years, is in charge of this new office. The company represents F. S. Getty & Company, Inc., of Philadelphia, makers of five marine joiner hardware.

San Francisco Cadet-Midshipmen At U. S. Merchant Marine Academy, Kings Point, New York

At right: Cadet-Midshipman Carl H. Swadell pays tribute to Kings Point war dead.

Below, left: Cadet-Midshipman B. J. Ronneberg plots a course in navigation at the Academy. Below right: The old sailing ship, the Emery Rice, serves as a reminder of the past when skill on a ship was determined by ability to scale the rigging, to the three S. F. Cadets, H. J. Bihler, J. E. Collins, and W. R. O'Brien.

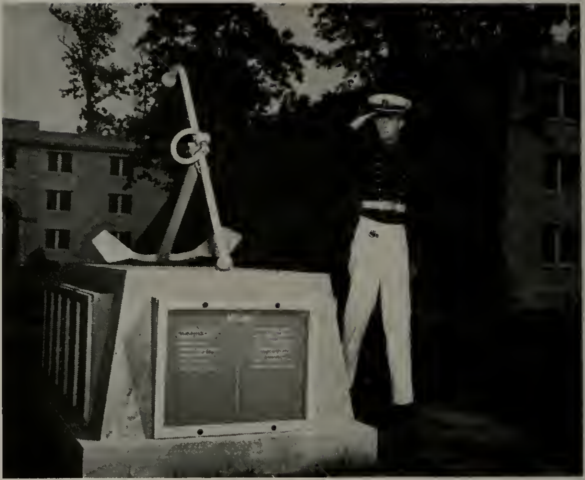
At bottom, left: Cadet Frederick Gross MacGurn, engineer candidate, works on a lathe in the Academy machine shop.

At bottom, right: The Gyrocompass is studied at close hand by H. J. Bihler and J. E. Collins.

Engineer candidates receive instruction in steam, electrical and diesel engineering, machine shop and other subjects related to marine engineering.

Deck candidates receive instruction in navigation, seamanship, communications, cargo stowage, and kindred subjects.

All Cadet-Midshipmen receive instruction in Naval Science, foreign and domestic economics, Spanish, French, English, history and science.



Pacific Marine Review

NEWS FLASHES

SEA SCORPION (C-3) TO BE CONVERTED AT SAN FRANCISCO.

Pacific Transport Lines, Inc., of San Francisco will take delivery this month of the steamers Sea Quail and Sea Scorpion, two of three C-3 type freighters recently purchased for its transpacific service at a cost of about $1,300,000 each. The Sea Quail has been completely reconverted at Baltimore and will make one westbound intercoastal voyage for the Maritime Commission before being taken over by the company at San Francisco late this month. The Sea Scorpion's reconversion will be completed at San Francisco when she arrives from the Gulf shortly. The third steamer purchased by Pacific Transport Lines, the Elmore, still is undergoing reconversion.

* * * * *

NEW TERMINAL COMPANY--SEATTLE

The West Waterway Dock Corporation has been formed to take over the so-called Todd Plant No. 3, which was an overflow yard on West Waterway, Seattle. President of the new firm is A. R. Van Sant, vice president of Lake Washington Shipyards. Vice President is Howe S. Foster of the MacLean Construction Company. The yard will be used for mooring and storage of deep-sea vessels, and later will be developed into an ocean shipping terminal.

* * * * *

TWO ALL-ALUMINUM VESSELS PROPOSED

The Aluminum Company of America is reported to be planning construction of two all-aluminum freight ships to be used primarily for carrying bauxite from Dutch Guiana to Trinidad, at which point the cargo will be transferred to deep-draft carriers. The proposed vessels will be 422 and 348 feet overall, beam 60 and 54 feet, and maximum draft 20 and 19 feet. There would be an estimated saving of 50 per cent in the weight of the hulls.

Plans for these ships were first discussed about a year ago.

* * * * *

COLUMBIA STEEL OFFERS TO BUY CONSOLIDATED

For the fixed assets of Consolidated Steel Corporation, as of August 31, 1946, Columbia Steel Company has offered $8,293,319, adjusted up to the time of sale. The offer is being considered by the stockholders. Assets, not fully controlled by Consolidated, are not included in the deal.

* * * * *

OPERATING-DIFFERENTIAL SUBSIDIES

Operating-differential subsidies, suspended after the nation entered World War II, are being resumed January 1, 1947, for twelve American steamship companies. These subsidies are authorized under the Merchant Marine Act of 1936 to enable American operators to compete on essential foreign trade routes with foreign vessels whose operating costs are lower.

PHILIPPINE CONSOLIDATED SHIPYARDS FORMED

Several interests, connected with Consolidated Steel Corporation, have formed the Philippine Consolidated Shipyards to engage in ship repair operations in the Philippines. In addition to Consolidated Steel, they are the following: Philippine Industrial Equipment Company; K. D. Dawson; Andres Soriano; S. D. Bechtel; A. K. Bechtel; John R. McCone; Morrison-Knudsen Company. Managers in Manila will be C. W. Lee and George S. Colley.

* * * * *

DATE FOR OPENING BIDS TO BUY USS HARRIS IS POSTPONED

Date for the opening of bids for the purchase of the USS Harris (ex-President Grant) has been postponed by the Maritime Commission from December 11, 1946, to January 13, 1947. The ship, offered for operation in domestic trades only, is a twin screw passenger-cargo vessel with an overall length of 535 feet, beam 72 feet, depth 50 feet, and draft 30 feet 7 inches. She is of 14,119 gross tons, 8,405 net tons, and 11,952 deadweight tons. She is driven by two steam turbines having a total of 12,000 shp, and her reported speed is 18 knots.

* * * * *

CONSOLIDATED STEEL GETS BIG PIPE ORDER

A contract for the fabrication of 100 miles of 26 inch O.D. welded steel pipe for delivery during 1947 has been awarded by the El Paso Natural Gas Company to Consolidated Steel Corporation. This is part of a natural gas pipeline project now under construction from Texas to Southern California. Last September, Consolidated was awarded a contract for 214 miles of 30 inch pipe by the Southern California Gas Company, for the western end of the line.

* * * * *

MARITIME COMMISSION REORGANIZES

Effective January 1, the work of the Maritime Commission will be performed by five departments. They will be: Legal, financial, purchase and sales, operations, and technical. A detailed outline of the functions of each department is available for readers who need it.

* * * * *

LOS ANGELES TO HAVE BOAT SHOW

Plans for an outdoor boat show and marine exposition to be held in the Los Angeles Coliseum from May 30 to June 8 are announced by California National Boat Shows, Inc., 6367 Wilshire Boulevard, Los Angeles.

* * * * *

EX-GERMAN MERCHANT SHIPS TO BE SOLD

Until 2:30 p.m. EST, January 15, the Maritime Commission will receive bids for the purchase of 11 former German merchant ships, now anchored in the Hudson River Reserve Fleet Basin, New York. The ships are part of the reparations awarded to the United States. Bid opening date has been postponed from January 3.

* * * * *

OLD PASSENGER-CARGO SHIPS FOR SALE

Until 2:15 p.m., January 17, bids will be received by the Maritime Commission for the purchase of the USS Neville (ex-City of Norfolk, ex-Independence). The ship was built in 1918 by Bethlehem-Alameda, California, and is offered without operational restrictions. She is 507 feet long, and was used by the Navy as a transport. Machinery was renewed in 1931.

RESERVE FLEET STATUS

Although 96 vessels were withdrawn, 121 merchant ships were added to the United States Maritime Commission's Reserve Fleet during the month ending December 15, raising the total moored at the nine fleet sites on that day to 1,742. Many of the vessels withdrawn were sold under the Merchant Marine Act of 1946, under which more than 700 war-built ships have been sold. The status of the Reserve Fleet sites December 15 was:

Sites	Entered	Withdrawn	Total
James River, Lee Hall, Va.	..	37	663
Suisun Bay, Martinez, Calif.	13	8	396
Mobile River, Mobile, Ala.	15	19	231
Astoria, Oregon	47	2	104
Olympia, Wash.	1	1	96
Beaumont, Texas	3	4	42
Hudson River, Tarrytown, N.Y.	..	24	127
Wilmington, N. C.	31	1	64
Brunswick, Ga.	11	..	19

Eight of the vessels placed in sanctuary during the month were constructed prior to 1940. All others were war-built.

* * * * *

SAN FRANCISCO BAY AREA EXPANDING

Following is a list of some of the big industries expanding in the San Francisco Bay Area as of January 1:

Columbia Steel Company	$25,000,000
Fibreboard Products Company	24,000,000
Johns-Manville	7,000,000
Paraffine Companies	4,500,000
Campbell Soup Company	4,500,000
American Radiator & Standard Sanitary	3,500,000
Green Industries	3,000,000
Shell Chemical	3,500,000
Blakes of Berkeley (Frozen pre-cooked meals)	3,000,000
United Air Lines	3,000,000
Tide Water Associated Oil Co.	2,500,000
Leslie Salt Co.	1,075,000
Marchant Calculator Co.	1,500,000
H. J. Heinz Co.	1,000,000
General Electric Co.	1,000,000
Blaw-Knox Company	1,000,000
Butler Packing Company	1,000,000
Pacific Can Company	1,000,000
Colgate, Palmolive-Peet Co.	1,000,000
International Mineral & Chemical Co.	1,000,000
Rainier Brewing Company	1,000,000
Westinghouse Electric Corporation	1,000,000
Sperry Flour Company	2,000,000
Beechnut Packing Company	800,000
Coca-Cola	1,000,000
Gar Wood Industries	750,000
Woolridge Manufacturing Co.	400,000
Standard Oil Company	7,000,000
Eastman Tag and Label Co.	400,000
U. S. Envelope	500,000
Schlage Lock Company	450,000

SHIP CHARTERS END FOR ALLIES JUNE 30

Under the wartime arrangements by which they were chartered, all of the 229 ocean-going cargo ships that Britain has under "bare boat" charter from the United States, and any ships similarly chartered by other Allies, must be bought outright or returned to the United States within six months of the declaration of the end of hostilities. The deadline is June 30. More important is the question of purchase. The chartered ships are managed for the Ministry of Transport by various British shipowners and many of the latter have put in bids for ships. It is understood shipowners can expect to receive the Treasury decision on these bids within the next few days and that in most cases the decision will be affirmative.

ALASKA RATE HEARINGS POSTPONED

The Maritime Commission's rate hearings, covering places in Alaska and also to terminal rate increases at Puget Sound ports, have been postponed to January 20 and 22 at the Olympic Hotel, Seattle.

* * * * *

C-2 AND C-3 CONVERSIONS FOR LYKES BROTHERS

Until 12:15 p.m., January 15, the Maritime Commission will receive bids for the reconditioning of the C-2 vessels Dyson Lykes and Red Gauntlet; also the C-3 vessels Almeria Lykes and Lipscomb Lykes.

* * * * *

CARL FLESHER TO CONDENSER SERVICE CO.

Carl W. Flesher, Pacific Coast regional director of construction for the U. S. Maritime Commission from 1942 to 1946, has become sales manager of the Condenser Service & Engineering Co., Inc., Hoboken, New Jersey. Mr. Flesher will make his headquarters in Hoboken, and will have charge of all the company's sales activities.

* * * * *

LLOYD SHIPPING COMPANY JOINS CONFERENCE

Lloyd Shipping Company, San Francisco, operating cargo, refrigerator and passenger service between California, Mexico, Central America, and Panama, has been admitted to membership in the Pacific Coastwise Conference.

* * * * *

PARRY NAVIGATION COMPANY JOINS CONFERENCE

The Parry Navigation Company, newest entry into transpacific trade, has been admitted to membership in the Pacific Westbound Conference.

* * * * *

INDUSTRIAL EXPANSIONS IN SOUTHERN CALIFORNIA

New industries, and expansion in Southern California during November totaled more than $28,000,000, bringing the total of new factories built during the year to 245 at $64,000,000, and expansions to 348 at $85,000,000. New industrial jobs were created for about 30,000. Included among the new industries are: Magna Box; Universal Match Corporation; Miracold of California; Sun Harbor Packing Company; Swedlow Plastics Company; M & L Tool and Die Manufacturing Company.

Current expansions include: Union Oil Company; General Petroleum; National Lead Company; U. S. Rubber Company; Pacific States Lacquer Corporation; Summers Gyroscope Company; Joslyn Company.

* * * * *

YOKOHAMA SERVICE RESUMED

American President Lines has rescheduled Yokohama, Japan, as a regular port of call on its transpacific passenger service itinerary. Included also in the new schedule, as a regular port of call, is Honolulu, which had been by-passed by the big passenger carriers on their postwar emergency runs between California and the Orient. The first passenger vessel to call at Yokohama will be the General W. H. Gordon, sailing from San Francisco January 31 via Seattle, thence to Japan, arriving at Yokohama February 14, and continuing over the regular route to Shanghai, Hong Kong and Manila.

Pacific
MARINE
REVIEW

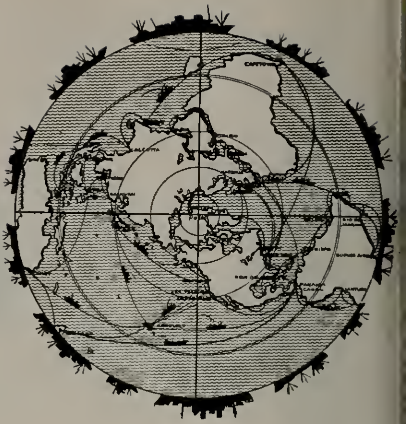
PACIFIC COAST DIRECTORY

OF

STEAMSHIP LINES & MARINE INSURANCE COMPANIES

These Directories will be republished from time to time, and it is requested that changes and additions be sent to us promptly

Pacific STEAMSHIP DIRECTORY



Ship Owners, Ship Operators and Their Agents with Offices on the Pacific Coast — Listed by Cities

CALIFORNIA

LOS ANGELES

AGWILINES, INC.
See, INTEROCEAN S. S. CORP., Agents

ALASKA PACKERS ASSOCIATION
See, W. R. GRACE & CO., Agents

ALASKA TRANSPORTATION CO.
See, CONSOLIDATED S. S. COMPANY, Agents

ALCOA STEAMSHIP CO
See, POPE & TALBOT, INC., Agents

AMERICAN EXPORT LINES, INC.
See, PARRY NAVIGATION CO. INC. Agents

AMERICAN-HAWAIIAN S. S. CO.
530 West 6th St. TUcker 8181
F. A. Hooper, Dist. Mgr.
S. S. Harlow, Asst. Dist. Mgr.
Berth 175, Wilmington Wilmington 4-4541
T. C. Swanson, Pier Supt.
W. A. Wahlgren, Port Engineer
J. F. Walsh, Chief Clerk

AMERICAN LIBERTY S. S. CORP.
See, INTEROCEAN S. S. CORP., Agents

AMERICAN MAIL LINES, LTD.
See, WILLIAMS, DIMOND & CO., Agents

AMERICAN PACIFIC STEAMSHIP CO.
541 S. Spring MIchigan 7412
H. H. Birkholm, President
Eugene Overton, Vice President & Secretary
Delmon M. White, Controller
G. E. Phillips, Asst. to Pres.
R. E. Morrell, Oper. Mgr.
Martin Faerber, Insurance
R. O. Lippens, Marine Supt.
P. V. Gaudin, Supt. Engineer
R. J. Armour, Port Capt.
M. O. Barnett, Port Steward & Purchasing Agt.
R. R. Campbell, Asst. Supt. Engineer
G. W. Curran, Asst. Supt. Engineer
H. Dreggors, Port Engineer
C. Duggan, Port Engineer
T. T. Overton, Port Engineer
G. G. Gulvin, Port Engineer

AMERICAN PIONEER LINE
715 W. 7th TRinity 8261

AMERICAN PRESIDENT LINES
510 W. 6th MUtual 4321
Edgar M. Wilson, General Agent
R. M. DeLong, Gen. Pass. Agt.
R. G. Dinwoodie, Dist. Pass. Agt.
S. J. Hindle, Asst. to General Agent
L. A. Menning, Dist. Freight Agent
I. D. Anderson, Chief Clerk
G. W. Schreader, Chief Accountant
Agents for:
JAMES GRIFFITHS & SONS
LYKES BROS. STEAMSHIP CO., INC.

ARROW LINE
See, SUDDEN & CHRISTIANSON, INC.

BALFOUR GUTHRIE & CO., LTD. AGENTS
530 W. 6th TRinity 9051
J. A. Sullivan, Dist. Mgr.
Lines:
DONALDSON LINE
BEN LINE
Service to U. K.

BEN LINE
See, BALFOUR GUTHRIE & CO., Agents

BERNUTH LEMBCKE CO.
See, POPE & TALBOT, INC., Agents

BLUE FUNNEL LINE
See, FUNCH, EYDE & CO., INC., Agents

BLUE STAR LINE, INC.
See, MARINE AGENCIES, LTD., Agents

BURNS STEAMSHIP COMPANY
727 W. 7th TRinity 1061

Also: 809 N. Avalon Blvd., Wilmington, Calif.

L. G. Burns, President
Val Larsen, Vice President
H. Neergaard, Marine Supt.
Capt. M. E. Christensen, Port Captain
H. Neergaard, Port Engineer
Agents For:
W. R. CHAMBERLIN & CO.
Service To:
All California, Oregon and Washington (Puget Sound including Canadian) ports. Present operation covers all world ports under W.S.A.

CANADIAN AUSTRALASIAN LINE
CANADIAN PACIFIC STEAMSHIP LINES
210 W. 7th VAndike 9890
T. A. Dickson, Dist. Freight Agent
Service To:
Vancouver to Pacific Ports

CHAMBERLIN, W. R., & CO.
See, BURNS S. S. CO.

COASTWISE LINE
715 W. 7th TRinity 8261
T. G. Maddox, District Manager

CONSOLIDATED S. S. COMPANY
Pier 1, Municipal Docks Phone 64996

J. H. Fay
Agents For:
ALASKA TRANSPORTATION CO.

CUNARD-WHITE STAR LINE
WHITE STAR LINE
606 S. Hill MIchigan 9478

W. H. Hanniven, Mgr.
Agents For:
DONALDSON ATLANTIC LINE

DECONHIL SHIPPING CO.
305 N. Avalon Blvd. TErminal 4-7281
Wilmington, Calif.
Agents For:
HILLCONE STEAMSHIP CO.

DE LA RAMA STEAMSHIP CO., INC., THE
530 W. 6th TUcker 5103
Ralph M. Hylton, Dist. Mgr.
R. D. Kingsbury, Asst. Dist. Mgr.
L. S. Copeland, Port Supt.
Sherman W. Elliott, Asst. Purch. Agt.
Lines:
DE LA RAMA LINES
THE SWEDISH EAST ASIATIC CO.
Service To:
Philippines & China

DICHMANN, WRIGHT & PUGH, INC.
See, PARRY NAVIGATION CO., INC., Agents

DODWELL & CO., LTD. AGENTS
111 W. 7th VAndike 3102
G. R. Bower, Manager
Agents For:
FRUIT EXPRESS LINE

DONALDSON ATLANTIC LINE
See, CUNARD WHITE STAR LINE, Agent

DONALDSON LINE
See, BALFOUR, GUTHRIE & CO., LTD., Agents

FRED OLSEN LINE
530 W. 6th MUtual 7323

FRENCH LINE
541 S. Spring MIchigan 7412
See, GENERAL STEAMSHIP CORP., LTD., Agents

FRUIT EXPRESS LINE
See, DODWELL & CO., LTD., Agents

FUNCH, EYDE & CO., INC.
111 W. 7th
J. W. Zundel, Dist. Mgr.
Agents For:
BLUE FUNNEL LINE

FURNESS (PACIFIC) LIMITED AGENTS
108 W. 6th TRinity 8111
R. V. Ross, Manager
Agents For:
HOLLAND AMERICA LINE
ROYAL MAIL LINE
PRINCE LINE, LIMITED

GENERAL PETROLEUM CORPORATION OF CALIF. MUtual 0171
Higgins Bldg., 108 W. 2nd St.
S. J. Dickey, President
J. M. Jesson, Secretary
H. Pew, Marine Buyer
R. C. Jones, Supt. Engineer
A. O. Wall, Manager Marine Dept.
Box A, Terminal Island TErminal 2-8311
Service To:
TANKER

GENERAL STEAMSHIP CORP., LTD.
541 South Spring AGENTS
OCEAN TERMINALS
Berth 230G, Terminal Island
W. B. Bryant, Dist. Mgr.
H. Reese, Terminal Supt.
W. W. Wynn, Chief Accountant
H. P. Wynn, Dist. Passenger Agent
Cox Birkholm, Traffic Dept.
Operating Dept. (San Pedro):
365 W. 7th St. TErminal 3-0151
R. H. Hannah, Local Manager
Agents For:
FRENCH LINE
INDEPENDENCE LINES
KERR STEAMSHIP CO.
PACIFIC AUSTRALIA DIRECT LINE
PACIFIC ISLANDS TRANSPORT LINE
PACIFIC MEDITERRANEAN LINE
PACIFIC ORIENT EXPRESS LINE
WESTFAL-LARSEN CO. LINE
SILVER LINE
SILVER-JAVA PACIFIC LINE

GRACE, W. R., & CO.
523 W. 6th MIchigan 7811
Wm. A. St. Amant, Manager
J. E. McLaughlin, Marine Supt.
D. Cutler, Traffic Mgr.
Agents For:
GRACE LINE
JOHNSON LINE
ALASKA PACKERS ASSOCIATION
J. H. WINCHESTER & CO., INC.
Service To:
Mexico, Central America, Panama, Colombia, Ecuador, Peru, Bolivia, Chile

GRACE LINE
See, W. R. GRACE & CO., Agents

GRIFFITHS, JAMES, & SONS
See AMERICAN PRESIDENT LINES, Agents

HOLLAND AMERICA LINES
See, FURNESS LINES, Agents

HILLCONE STEAMSHIP CO.
See, DECONHIL SHIPPING CO.

INDEPENDENCE LINES
See, GENERAL S. S. CORP., LTD., Agents

INTERNATIONAL FREIGHTING CORP.
See, POPE & TALBOT, INC., Agents

INTERNATIONAL TERMINALS, INC.
215 W. 6th St. AGENTS
Max G. Linder, President & Gen. Manager
Roland C. Stevens, Vice President
A. Malone, Superintendent

INTEROCEAN LINE
See, INTEROCEAN S. S. CORP., Agents

INTEROCEAN S. S. CORP. AGENTS
111 W. 7th TUcker 3111
W. F. Wilkinson, District Manager
W. J. Sweeney, Traffic Mgr. & Purch. Agent

J. Robert Gaffney, Operating Manager
C. F. Staples, Customs & Claims Dept.
266 W. 7th Street, San Pedro
Lines:
INTEROCEAN LINE
KNUTSEN LINE
PACIFIC COAST DIRECT LINE
WEYERHAEUSER LINE
AGWILINES INC.
SALEN LINE
AMERICAN LIBERTY S.S. CORP.

ISTHMIAN LINE
510 W. 6th TRinity 7921
W. C. Fulton, Manager
J. Eitze, Pier Agent
Service To:
Intercoastal; North Atlantic, Gulf. Transpacific; United Kingdom

JAVA PACIFIC LINE
INDIES TERMINAL CO.
R. R. Bennett, Marine Supt.
Berth 230-B HArbor 6466
Terminal Island, California
See, TRANSPACIFIC TRANS. CO., Agents

JOHNSON LINE
See, W. R. GRACE & CO., Agents

KERR STEAMSHIP CO.
See, GENERAL S. S. CORP., Agents

KEYSTONE SHIPPING COMPANY
See, W. H. WICKERSHAM & CO., Agents

KLAVENESS LINE
See, SUDDEN & CHRISTENSON OVERSEAS CORP., Agent

KNUTSEN LINE
Los Angeles, California
See, INTEROCEAN S. S. CORP., Agents

LA LINIA DE VAPORES
See, RED ANCHOR DOCK & S. S. CO., Agents

LAMBERT BROS., LTD.
See, TRANSMARINE TRANSP. CORP., Agents

LAURITZEN LINE (P. F. Soto Shipping Co.)
704 S. Spring VAndike 6666

LLOYD SHIPPING CO.
530 W. 6th MIchigan 8497
R. O. Vernon, Manager
Service To:
Mexico, Central America and Panama

LUCKENBACH GULF STEAMSHIP CO., INC.
LUCKENBACH STEAMSHIP CO., INC.
621 S. Hope TRinity 7881
E. A. MacMahon, District Manager
B. J. Callighlin, Asst. Dist. Mgr.
L. J. Miller, Terminal Supt.

LYKES BROS. STEAMSHIP CO., INC.
See, AMERICAN PRESIDENT LINES, Agents

MARINE AGENCIES, LTD.
815 Preble Ave., Box 365 TErminal 4-7227
Wilmington, California
E. W. Horsman, Owner
O. W. Pearson, Manager
W. R. Dial, Asst. Manager
Agents For:
BLUE STAR LINE
Service To:
Pacific Coast—U. K.
Passengers—Refrigerator and General Cargo

MATSON NAVIGATION CO.
Freight Offices, 550 So. Grand VAndike 2421
R. J. Chandler, Vice Pres. & Gen. Mgr.
J. B. Banning, Jr., Asst. Frt. Traffic Mgr.

McCORMICK S. S. CO.
See POPE & TALBOT, INC.

MOORE-McCORMACK LINES, INC.
530 W. 6th TRinity 7171
A. P. Smith, Manager
R. R. Abbott, Frt. Agt.
E. M. Salter, Oper. Dept.

NORTON LILLY & CO.
210 W. 7th TRinity 3044

OCEANIC S. S. CO.
550 So. Grand VAndike 2421

OLIVER J. OLSON & CO.
106 East "F" St. TErminal 4-2694
Wilmington, California
Service:
Coastwise Lumber Carriers

PACIFIC ATLANTIC S. S. CO.
606 So. Hill MAdison 7787
W. C. Ricks, Dist. Mgr.
J. D. Teague, Terminal Supt.
Agents For:
QUAKER PACIFIC LINE
Service To:
Intercoastal

PACIFIC AUSTRALIA DIRECT LINES
See, GENERAL S. S. CORP., LTD., Agents

PACIFIC COAST DIRECT LINE
See, INTEROCEAN S. S. CORP., Agents

PACIFIC ISLANDS TRANSPORT LINE
541 S. Spring MIchigan 7412
Service To:
South Seas and New Caledonia
See, GENERAL STEAMSHIP CORP., LTD., Agents

PACIFIC MEDITERRANEAN LINE
See, GENERAL S. S. CORP., LTD., Agents

PACIFIC ORIENT EXPRESS LINE
See, GENERAL S. S. CORP., LTD., Agents

PACIFIC TRANSPORT LINES
See, WILLIAMS, DIMOND & CO., Agents

PANAMA PACIFIC LINE
See: UNITED STATES LINES CO., Agents

PARRY LINES
See, PARRY NAVIGATION CO., INC., Agents

PARRY NAVIGATION COMPANY, INC.
Rm. 216, 510 W. 6th MAdison 6-2037
Wm. J. Sweeney, District Manager
Agents For:
PARRY LINES
AMERICAN EXPORT LINES, INC.
DICHMANN, WRIGHT & PUGH, INC.

PHILIPPINE-DE LA RAMA
530 W. 6th TUcker 5103

POLARIS STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

POPE & TALBOT, INC.
McCormick Steamship Division
714 W. Olympic Blvd. PRospect 8231
W. Kenneth Pope, Vice President
Geo. H. Bushnell, District Manager
Berth 146, Wilmington TErminal 4-2531
Capt. C. E. Larson, Dist. Op. Manager
J. R. Waters, Dock Superintendent
Agents For:
ALCOA STEAMSHIP CO.
INTERNATIONAL FREIGHTING CORP.
PRUDENTIAL STEAMSHIP CO.
POLARIS STEAMSHIP CO.
SMITH & JOHNSON
SPRAGUE STEAMSHIP CO.
STOCKARD STEAMSHIP CORP.
U. S. NAVIGATION CO.
BERNUTH LEMBCKE CO.
WESSEL DUVAL & CO.
Service To:
World Ports, Intercoastal, and Puerto Rico

PRINCE LINE, LTD.
See, FURNESS LINE, Agents
108 W. 6th TRinity 8111

PRUDENTIAL STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

QUAKER PACIFIC LINE
See, PACIFIC ATLANTIC S. S. CO. & STATES STEAMSHIP CO., Agents

RED ANCHOR DOCK & S. S. CO.
P. O. Box 345 Long Beach 639-00
Long Beach, California
D. A. Linthicum, President
C. J. Chodzko, secretary
Agents For:
STOCKTON-LONG BEACH S. S. CO.
RED ANCHOR S. S. LINES
LA LINIA DE VAPORES
Handle all lumber lines discharging at Red Anchor Docks.

RED ANCHOR S. S. LINES
See, RED ANCHOR DOCK & S. S. CO., Agents

RICHFIELD OIL CORPORATION
555 S. Flower TRinity 2231
P. C. Lamb, Manager Marine Department
W. H. Wilder, Port Capt.
C. G. Reed, Port Engineer

ROYAL MAIL LINES, LTD. (FREIGHT)
108 W. 6th TRinity 8111
See, FURNESS LINE, Agents

SALEN LINE
See, INTEROCEAN S. S. CORP., Agents

SILVER-JAVA PACIFIC LINE
See, GENERAL S. S. CORP., LTD., and TRANSPACIFIC TRANS. CO., Agents

SILVER LINE
See, GENERAL STEAMSHIP CORP., LTD., Agents

SMITH & JOHNSON
See, POPE & TALBOT, INC., Agents

SPRAGUE STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

STANDARD OIL CO. OF CALIFORNIA
P. O. Box 910
Harbor Blvd., San Pedro
Capt. T. W. Peters, Marine Supt.

STATES STEAMSHIP CO.
606 So. Hill MAdison 7787
W. C. Ricks, Manager
J. D. Teague, Terminal Supt.
Agents For:
QUAKER PACIFIC LINE

STOCKARD STEAMSH'P CORP.
See, POPE & TALBOT, INC., Agents

STOCKTON-LONG BEACH S. S. COMPANY
See, RED ANCHOR DOCK & S. S. CO., Agents

SUDDEN & CHRISTENSON, INC.
111 W. 7th TRinity 8844
Agents For:
ARROW LINE
WATERMAN S. S. CO.

SUDDEN & CHRISTENSON OVERSEAS CORP.
111 West 7th TRinity 8844
Agents For:
BARBER LINE
BARBER WILHELMSON LINE
KLAVENESS
FERN LINE

SWEDISH EAST ASIATIC CO.
See, DE LA RAMA S. S. CO., INC., Agents

TEXAS COMPANY, THE
929 S. Broadway TRinity 9271
Berth 172
Wilmington, Calif. TErminal 41181, 2
Long Beach, Calif. Long Beach 71122
Daniel Dobler, Marine Supt.
W. C. Clayton, Terminal Supt.
Clarence Victor Peterson, Port Engineer

TIDE WATER ASSOCIATED OIL CO.
Box 227, Wilmington Rd.
San Pedro, Calif.
G. A. Reeve, Marine Supervisor
G. H. Hayter, Asst. Purchasing Agt.
Pacific Electric Bldg., Los Angeles

TRANSATLANTIC S. S. CO., LTD.
See, GENERAL STEAMSHIP CORP., Agents

TRANSMARINE NAVIGATION CORPORATION AGENTS
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Max G. Linder, Pres. & Gen. Mgr.
Roland C. Stevens, Vice Pres.
A. Malone, Superintendent
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LAMBERT BROTHERS, LTD.
WALLEN & CO.
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Long Beach 2, California
Berth 228-D TErminal 3-2741
Terminal Island, California
Terminal Operators, Ship Operators, Ship Agents, Freight Forwarders, Bunkering Agents, Chartering Brokers.

TRANSPACIFIC TRANSPORTATION CO.
530 W. 6th AGENTS
TUcker 2511
C. F. Yenney, District Manager
Lines:
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JAVA PACIFIC LINE
INDIES TERMINAL COMPANY
Service To:
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UNION OIL CO. OF CALIFORNIA
617 W. 7th **TUcker 7211**
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W. L. Stewart, Jr., Exec. Vice President
Ronald D. Gibbs, Vice Pres.
J. B. Stene, Mgr., Marine Oper.
A. E. Morrison, Insurance Off.
L. L. Lishman, Port Capt.
R. H. Cyrus, Port Engineer
Wenzel Peck, Port Steward
E. H. Weaver, Purch. Agt.
H. W. Sanders, Secretary-Treasurer
Service To:
Coastwise and Hawaiian Trading

UNITED FRUIT COMPANY
Pier 147 **TErminal 4-2631**
Wilmington, California
L. D. Burkhart, Res. Mgr.

UNITED STATES LINES CO.
(Panama Pacific Line)
715 W. 7th St. **TRinity 8261**
T. G. Maddox, District Manager
C. F. Downey, Terminal Supt.
Service To: Coastwise

U. S. NAVIGATION CO.
See, POPE & TALBOT, INC., Agents

WALLEN & CO.
See, TRANSMARINE NAVIGATION CORP., Agents

WATERMAN STEAMSHIP CO.
See, SUDDEN & CHRISTENSON, INC., Agents

WEST COAST LINE OF COMPANIA MERCANTE DE LA COSTA OBESTE SA
714 W. Olympic **PRospect 3937**
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Captain O. J. Olsen, Port Captain

WESSEL DUVAL & CO.
See, POPE & TALBOT, INC., Agents

WESTFAL-LARSEN CO. LINE
See, GENERAL S. S. CORP., LTD., Agents

WEYERHAEUSER LINE
See, INTEROCEAN S. S. CORP., Agents

WHITE STAR LINE
606 S. Hill **TUcker 5208**

WILLIAMS, DIMOND & CO.
609 So. Grand **TUcker 8181**
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Guy C. Reynolds, Dist. Freight Agt.
C. A. Jones, Pier Supt., So. Calif.
(Berth 228-E, Terminal Island, Calif. Dock—Berth 228-E.)
Agents For:
AMERICAN MAIL LINE
AMERICAN REPUBLICS CORP.
A. H. BULL & CO., INC.
BLACK DIAMOND STEAMSHIP CORP.
BOLAND & CORNELIUS
COMMERCIAL MOLASSES CORP.
EASTERN STEAMSHIP LINES, INC.
MARINE TRANSPORT LINES, INC.
MORAN TOWING & TRANSPORTATION CO., INC.
PACIFIC TRANSPORT LINES
SEAS SHIPPING CO., INC.
SOUTH ATLANTIC STEAMSHIP LINE
TANKERS COMPANY, INC.
UNION STEAMSHIP CO. OF NEW ZEALAND, LTD.
WILMORE STEAMSHIP CO., INC.
Service To:
Transpacific: Shanghai, Hong Kong, Manila to Los Angeles & San Francisco. AMERICAN MAIL from Seattle to Shanghai & Manila, Vancouver, Seattle, San Francisco, Los Angeles, Tahiti, New Zealand and Australia

WILMINGTON TRANSPORTATION CO.
Catalina Terminal, Box 847 **TErminal 4-5241**
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Philip K. Wrigley, President
C. F. Fennema, Vice Pres. & Gen. Mgr.
C. F. Fennema, Insurance
D. P. Fleming, Secretary
L. H. Connor, Operating Mgr., Wilmington
W. L. Scott, Port Eng., Wilmington
J. N. Crowell, Purch. Agent, Wilmington
W. H. Leisk, Manager, Tugboat Dept.,
J. J. Parker, Freight Agt.
Service To:
Tugboat Service — Los Angeles, Long Beach Harbors
Steamer Service — Wilmington to Avalon, Santa Catalina Island, California

WINCHESTER, J. H. & CO., INC.
See, GRACE LINE, Agents

SAN DIEGO

ALASKA S. S. CO
See, W. P. ELLIOT, Agents

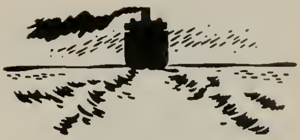
AMERICAN-HAWAIIAN S. S. CO.
CRESCENT WHARF & WAREHOUSE CO., Agents

AMERICAN PRESIDENT LINES
See, W. P. ELLIOT, Agents

ELLIOT, W. P. **AGENT**
336 C Street **FRanklin 6581**
Agents For:
ALASKA S. S. CO.
AMERICAN PRESIDENT LINES

GRACE LINES
1030 W. Broadway **FRanklin 0453**

OCEANIC S. S. CO.
213 Broadway **FRanklin 4722**



SAN FRANCISCO

AGWILINES, INC.
See, INTEROCEAN STEAMSHIP CORP., Agents

ALASKA PACKERS ASSOCIATION
111 California **GArfield 7360**
A. K. Tichenor, President
C. A. Iversen, Vice President
A. C. Mott, Secretary-Treasurer
R. A. Stack, Asst. Secretary
R. E. Astrup, Marine Superintendent & Port Eng.
M. E. Wall, Asst. Marine Superintendent
H. B. Adams, Oper. Manager
Oscar Sundby, Port Steward
B. P. Thornton, Purchasing Agent

ALASKA TRANSPORTATION CO.
See, OLYMPIC STEAMSHIP CO., INC., Agents

ALCOA STEAMSHIP CO., INC.
420 Market Street **EXbrook 4695**
Harry Hulf, Traffic Rep.
See, POPE & TALBOT, INC., Agents

AMERICAN EXPORT LINES, INC.
233 Post St. **GArfield 7556**
Frank E. Short, District Representative
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215 Market Street **SUtter 5841**
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T. G. Plant, Vice President
W. Dearborn Clark, V. P. & Traffic Mgr.
C. M. Fedderman, Treasurer
A. E. Stow, Pacific Oper. Manager
G. V. Cooley, Pacific Coast Traffic Mgr.
L. Formosa, Asst. Traffic Mgr.
E. M. Slevin, Pacific Purchasing Agent
Capt. N. J. Kane, Marine Supt.
F. P. Ritchie, Superintending Engineer
J. M. Pruner, Purchasing Agent
E. E. Voellings, Port Steward
Wilmer C. Webb, Pacific Insurance & Claim Agent
Sailings every ten days from Boston, Philadelphia, New York; to Los Angeles, San Francisco, Oakland, Alameda, Portland, Seattle and Tacoma, and from Tacoma, Seattle, Portland, Stockton, Oakland, Alameda; San Francisco and Los Angeles to New York, Philadelphia and Boston
Service from Baltimore, Norfolk, Charleston and Savannah to San Diego, Los Angeles, San Francisco, Oakland, Alameda, Portland, Seattle and Tacoma, and from Tacoma, Seattle, Portland, Stockton, Oakland, Alameda, San Francisco and Los Angeles to Jacksonville, Savannah, Charleston, Wilmington (N. C.), Norfolk and Baltimore; eastbound service to Puerto Rico.

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369 Pine Street EXbrook 1468
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Frank W. Smith, Port Engineer
O. D. Higgins, Port Engineer

AMERICAN MANCHURIAN LINE
See, NORTON, LILLY & CO., Agents

AMERICAN-PACIFIC STEAMSHIP CO., INC.
See, GENERAL STEAMSHIP CORPORATION, Agents

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311 California Street DOuglas 6000
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A. B. Poole, Vice Pres. & Treasurer
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Hugh Mackenzie, Vice Pres. (Passenger Traffic)
Paul H. Bordwell, Vice President, Orient (Shanghai)
E. D. Flaherty, Secretary
T. J. Cokely, Operating Manager
A. A. Alexander, General Manager Eastern Territory (NYC)
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W. H. Sharon, Director, Industrial Relations
W. K. Varcoe, Freight Traffic Manager
W. J. Johnstone, Passenger Traffic Manager
W. G. Pearch, Marine Superintendent
Carl Nordling, Port Superintendent
J. Jacobsen, Port Engineer
Harry Young, Port Captain
T. Mullen, Catering Superintendent
F. L. Morgan, General Purchasing Agent
Reginald S. Laughlin, General Counsel
Service To:
(Transpacific and Round-World Passenger and Freight Service) New York, Boston, Havana, Cristobal, Balboa, Los Angeles, San Francisco, Honolulu, Yokohama, Kobe, Shanghai, Hong Kong, Manila, Singapore, Penang, Colombo, Bombay, Suez, Port Said, Alexandria, Naples, Genoa, Marseilles

AMERICAN REPUBLICS CORP.
See, WILLIAMS, DIMOND & CO., Agents

AMERICAN SOUTH AFRICAN LINE
See, NORTON, LILLY & CO., Agents

AMERICAN TRADING CO.
311 California Street YUkon 6-0344
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J. J. Geary, Vice President
Ian Armstrong, Secretary-Treasurer
Service to be resumed later.

ARROW LINE
See, SUDDEN & CHRISTENSON, Agents

AUSTRALIAN DISPATCH LINE
See, J. J. MOORE & CO., Agents

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David Lindquist
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Pacific Coast Ports to London, Liverpool, Glasgow.

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W. H. Chick, Secretary
P. F. Brown, Manager
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BARBER ASPHALT CO.
See, DECONHIL SHIPPING COMPANY, Agents

BARBER S. S. LINES, INC.
See, SUDDEN & CHRISTENSON OVERSEAS CORP., Agents

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1 Webster St., Oakland GLencort 3277
W. G. Westman, General Manager
R. W. Dyer, Operating Manager
C. R. Escher, Traffic Manager
Service To:
San Francisco - Oakland - Alameda - Emeryville - Berkeley - Richmond - and River Points.

BLACK DIAMOND STEAMSHIP CO.
See, WILLIAMS, DIMOND & CO., Agents

BLUE FUNNEL LINE
See, FUNCH, EYDE & CO., INC., Agents

BLUE STAR LINE, INC.
465 California Street EXbrook 1580
J. Van Meurs, Calif. District Mgr.
Agents For:
BLUE STAR LINE, LTD.
London, England
Service To:
Liverpool, Glasgow, London, Newcastle, Hull.

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R. K. Hunter, Port Traffic Manager
Thos. E. Twohig, Rental Manager
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BROCKLEBANK, T & J., LTD.
See, CUNARD WHITE STAR LIMITED, Agents

A. H. BULL & CO.
See, WILLIAMS, DIMOND & CO., Agents

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615 Hearst Bldg. YUkon 6-1001

CALMAR LINES
Pier 48, Shed B SUtter 6920

CANADIAN AUSTRALASIAN LINE
675 Market Street DOuglas 0134
S. E. Corbin, General Agt. Passenger Dept.
A. E. Walker, District Freight Agent
681 Market Street GArfield 5185
San Francisco, California

CANADIAN NATIONAL STEAMSHIPS
681 Market Street (Freight Dept.) SUtter 5091
Service To:
Vancouver, B. C., Powell River, Ocean Falls, Prince Rupert, B. C.; Ketchikan, Alaska

CANADIAN PACIFIC STEAMSHIPS, LTD.
152 Geary Street SUtter 1585
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CANADIAN AUSTRALASIAN LINE

CIA. MARITIMA DEL NERVION, BILBAO
See, KERR STEAMSHIP COMPANY, INC., Agents

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W. R. Chamberlin, Jr., Vice President
Jos. A. Lunny, Operating Manager
J. J. Lamping, Secretary
W. R. Chamberlin, General Manager
George T. Rowse, Insurance
L. H. Beckendorf, Purchasing Agent
T. L. Tomlinson, Marine Superintendent
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J. G. Kelly, Port Engineer
Arnold Hughes, Port Steward
John R. King, Comptroller
Service To:
World wide

COASTWISE LINE
See, UNITED STATES LINES CO., Agents

COASTWISE (PACIFIC FAR EAST) LINE
222 Sansome Street DOuglas 8680
Partners:
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W. D. Sexton
B. H. Parkinson, General Manager
R. S. Kimberk, Executive Asst.
W. T. Sexton, Jr., Executive Asst.
D. J. Seid, Insurance Official
E. A. Gardner, Purchasing Agent
A. G. Safholm, Marine Supt.
D. Flint, Port Captain
V. Foel, Port Engineer
F. O. Ingham, Port Steward
J. A. Borthrop, Freight Agent

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J. C. Strittmatter, General Manager
David Gregory, Mgr. of Operations & Traffic
Pier 16 DOuglas 7207
Terminal Operators and Contracting Stevedoring

CROWLEY LAUNCH & TUGBOAT CO.
Pier 14 EXbrook 1743

CUNARD WHITE STAR LIMITED
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H. G. DeGolia, San Francisco Manager
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PENINSULAR & ORIENTAL LINE
DONALDSON ATLANTIC LINE

DECONHIL SHIPPING COMPANY
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C. A. Ames, Vice President
Stanley Hiller, Vice President
E. B. DeGolia, Vice President
L. R. Kerdell, Secretary-Treasurer
Fred H. Cordes, Marine Superintendent
Lloyd Richardson, Superintending Engineer
M. C. Wright, Port Engineer
Agents For:
BARBER ASPHALT CO.
STANDARD FRUIT & S. S. CO.

DE LA RAMA STEAMSHIP CO., INC., THE
230 California Street EXbrook 8560
Hugh Middleton, Pacific Coast Mgr.
Carl C. Bland, Executive Assistant
James E. Black, Asst. Oper. Mgr.
James A. Riemers, Port Engineer
P. F. Baker, Port Steward
W. D. Hampshire, Purch. Agent
Agents For:
DE LA RAMA LINE
THE·SWEDISH E. A. CO.
Service To:
Philippines, China

DODWELL & CO., LTD. AGENTS
465 California Street GArfield 8047
Norman Hardie, Manager
Lines:
BARBER LINE

DONALDSON ATLANTIC LINE
See, CUNARD-WHITE STAR, LTD., Agents

DONALDSON LINE, LTD.
(Donaldson Bros. & Black, Ltd.—Glasgow Scotland)
L. P. Bailey, Manager
David Lindstedt, Operating Manager
J. L. Brainerd, Traffic Manager
See, BALFOUR GUTHRIE & CO., LTD., Agents

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433 California Street EXbrook 7324
Rasmus Hansen, President
Magens Bildsoe, Vice Pres.
K. G. Rasmussen, Sec.-Treas.
Guomund Laugesen, Operating Mgr.
J. H. Ollerdessen, Traffic Mgr.

EASTERN STEAMSHIP CO., INC.
See, WILLIAMS, DIMOND & CO., Agents

ELLERMAN & BUCKNALL S. S. CO., LTD.
See, NORTON, LILLY & CO., Agents

FLOOD LINES, INC.
177 Post Street GArfield 9178

FRENCH LINE
See, GENERAL S. S. CORP., Agents

FRUIT EXPRESS LINE
(Sigurd Herlofson & Co.—Als, Oslo, Norway)
See, DODWELL & CO., LTD., Agents

FUNCH, EYDE & CO., INC. AGENTS
260 California Street DOuglas 5373
H. N. Middleton, Pacific Coast Mgr.
J. D. Kriel, Assistant Manager
Agents For:
BLUE FUNNEL LINE
Service To
Far East

FURNESS (PACIFIC) LIMITED AGENTS
231 California St. GArfield 8711
James West, Pacific Coast Manager
G. Salt, Financial Manager, Insurance
G. R. Nowlin, Traffic Manager
C. Pryor, Operating Manager
Capt. C. E. Holland, Marine Supt.
Lines:
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FURNESS LINE

GENERAL PETROLEUM CORPORATION
417 Montgomery Street EXbrook 6411
A. O. Woll, Director & Mgr. Marine Dept.
L. J. Moore, Asst. Mgr. Marine Dept.
B. F. Ball, Resident Mgr. Sales Dept.
Clark G. Walker, Asst. Division Mgr. Sales Dept.
C. E. Dole, Mgr. Marine Dept., San Francisco
Mrs. S. M. Butler, Marine Dept., San Francisco
Agents For:
SOCONY-VACUUM OIL CO., INC.
STANDARD VACUUM OIL CO.
Service To:
Coastwise, Worldwide

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EXbrook 4100
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Drew Chidester, Executive Vice President
R. V. Winquist, Vice Pres. in charge of Traffic
G. B. Schirmer, Vice Pres. in charge of Terminal Operations
A. K. Hulme, Vice Pres. in charge of Operations and Charters
Operations & Charters:
A. K. Hulme, Vice Pres.
Peter Curtis, Asst.
John Keast, Asst.
John R. Bertolani, Operating Mgr.
K. A. Hulme, Asst.
P. C. Sears, Operating Dept.
E. Weidel, Operating Dept.
Lawrence M. Amman, Purchasing Agent & Port Steward
W. Plunket, Port Purser
J. M. Michaelsen, Insurance Claims & Reports
Traffic Dept.:
R. V. Winquist, Vice Pres.
C. A. Reali, General Traffic Mgr.
A. E. Johnson, Asst. Mgr., South Seas & So. American Depts.
V. Johansson, Asst. Mgr., Central American Dept.
L. I. McKim, General Freight Agent
John Cummings, Asst.
Morse Frazier, Mgr. Australian & Oriental Dept.
J. R. Page, Mgr. European Dept.
R. W. King, Passenger Traffic Mgr.
L. M. Cerruti, District Passenger Agent
H. Walmsley, Mgr., Claims Dept.
W. E. Bunker, Mgr. Terminal Operations (Pier No. 41)
Agents For:
AMERICAN-PACIFIC STEAMSHIP CO.
FRENCH LINE
INDEPENDENCE LINE
PACIFIC-AUSTRALIA DIRECT LINE
PACIFIC ISLANDS TRANSPORT LINE
PACIFIC-MEDITERRANEAN LINE
PACIFIC-ORIENT EXPRESS LINE
WESTFAL-LARSEN CO. LINE

GIRDWOOD SHIPPING COMPANY
See, LLOYD SHIPPING COMPANY, Agents

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2 Pine Street SUtter 3800
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D. N. Lillevand, Oper. Manager
Harry Thompson, Traffic Manager
R. E. Pyke, Asst. Traffic Mgr.
F. L. Hardy, Asst. Traffic Manager
G. T. Littlejohn, Steamship Acct.
Capt. P. H. Gallagher, Port Captain
E. J. Graff, Port Engineer
G. F. Williams, Asst. Oper. Manager
A. C. Brownlie, Asst. Claim Agent
C. A. Nelson, Auditor
R. C. Rose, Purch. Agent
E. T. Senter, Marine Supt.
A. Cobbett, Port Steward
A. C. Holsten, Stevedore Superintendent
Agents For:
JOHNSON LINE
Pacific Coast-European Scandinavian Service
Service To:
Mexico, Central America, Panama, C. Z., Colombia, Ecuador, Peru Bolivia, Chile

GRACE, W. R., & CO.
2 Pine Street SUtter 3700
H. S. Parsons, Vice President
W. V. Lynch, Asst. Mgr.
W. E. Rodgers, Asst. Mgr.
G. H. Mahoney Asst. Mgr.

HAMMOND SHIPPING CO., LTD.
417 Montgomery Street AGENTS
DOuglas 3388
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R. G. Robinson, Vice Pres. & Gen. Mgr.
S. L. Rea, Secretary
G. B. McLeod, Vice Pres.
P. B. Babcock, Port Steward
Kenneth Huntington, Purchasing Agent
Wm. Meriwether, Port Capt.
A. T. Jones, Port Engineer
General Agents For:
U. S. MARITIME COMMISSION

HILLCONE S. S. CO., LTD.
311 California Street EXbrook 2365
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Joseph J. Coney, Vice Pres. & Gen. Mgr.
E. B. DeGolia, Vice President
C. A. Ames, Vice Pres & Operating Mgr.
L. R. Kerdell, Secretary & Treasurer

HOLLAND-AMERICA LINE
233 California Street DOuglas 7510
E. F. R. de Lanoy, Pacific Coast Manager
W. Klaasen, Asst. Pacific Coast Manager
D. de Vries, Asst. Traffic Manager
T. P. Guerin, Pacific Coast Pass. Agent
H. Th. Page, Accountant
E. Daniels, Dock Superintendent
Agents For:
ROYAL MAIL LINES, LTD.
Service To:
U. K. & Continent

HOLWAY STEAMSHIP CO.
465 California Street EXbrook 7534
P. M. Holway, President
Pacific Coast Agents For:
MOSVOLD LINE

INDEPENDENCE LINE
See, GENERAL STEAMSHIP CORP., LTD., Agents

INTERNATIONAL FREIGHTING CORP.
See, POPE & TALBOT, INC., Agents

INTEROCEAN STEAMSHIP CORP.
311 California Street AGENTS
DOuglas 7729
Harry Brown, President
Erik Krag, Exec. Vice Pres.
R. W. Cabell, Vice Pres.

INTEROCEAN STEAMSHIP CORP.
Continued
R. G. Thomas, Treas. & Comptroller
E. Berlund, Secretary
S. F. Alioto, Traffic Mgr. European
H. B. Godwin, Traffic Mgr. Oriental
E. Walker, Traffic Mgr. Intercoastal and South America
J. F. Litz, Operating Mgr.
S. A. Hess, Operating Dept.
W. E. Morris, Operating Dept.
C. J. Hunt, Asst. Controller
C. M. Noble, Intercoastal Dept.
J. F. Gisler, Marine Supt.
R. I. Jacobs, Purch. Agent
Chas. J. Keller, Port Steward
Lines:
INTEROCEAN LINE
KNUTSEN LINE
WEYERHAEUSER LINE
PACIFIC COAST DIRECT LINE
SALEN LINE
AGWILINES, INC.
AMERICAN LIBERTY STEAMSHIP CORP.
U. S. MARITIME COMMISSION

INTEROCEAN LINE
(Westfal-Larsen & Co. A/S—Bergen, Norway)
See, INTEROCEAN STEAMSHIP CORP., Agents

ISTHMIAN S. S. CO.
215 Market Street **YUkon 0562**
A. E. Blake, Mgr., Pacific Division
R. G. Sullivan, Oper. Mgr., Pacific Div.
J. J. Jacobs, Traffic Mgr., Pacific Div.
Capt. E. Lucas, Asst. Marine Supt.
H. M. Gaither, Asst. Supt. Eng.
J. Priele, Port Steward
W. H. Yost, Asst. Operations Mgr.
Service To:
Intercoastal, Philippines, China, Netherlands East Indies, French Indo-China, Straits Settlements (Malaya), Hawaiian Islands, India, Ceylon, Burma, Persian Gulf, Egypt, Palestine, Syria, Red Sea.

IVARIAN LINE
See, C. F. SHARP, Agents

JOHNSON LINE
(Rederiaktiebolaget Nordstjernan—Stockholm, Sweden)
See, GRACE LINE, Agents

KERR STEAMSHIP COMPANY, INC.
324 Sansome Street **YUkon 6-0943**
E. Wright, Vice President
A. L. Wise, Traffic Manager
R. H. Anderson, Marine Supt.
Agents For:
SILVER LINE, LTD., LONDON
SILVER-JAVA PACIFIC LINE
SILVER ROUND WORLD SERVICE
LEIF HOEGH, OSLO
CIA, MARITIMA DE NERVION, BILBAO
NAVIERA AZNAR, S. A., BILBAO
Service To:
Philippine Islands, China, Netherlands East Indies, Straits Settlements, Burma, India, Ceylon, Iraq, Iran (Persian Gulf), South and East Africa Red Sea, Mediterranean and Spanish Ports.

KEYSTONE SHIPPING COMPANY
See, THORLEY & PITT, Agents

KINGSLEY CO. OF CALIF.
(Kingsley Navigation Co.)
260 California Street **SUtter 8156**
R. J. Deremer, Manager
Service To:
CALIFORNIA-BRITISH COLUMBIA

KLAVENESS LINE
See, SUDDEN & CHRISTENSON, Agents
Christian Blom, Pacific Coast Representative
To: PACIFIC COAST-ASIATIC SERVICE

KNUTSEN LINE
(Knut Knutsen, O.A.S.—Haugesund, Norway)
See, INTEROCEAN S. S. CORP.

LATIN-AMERICA LINE
See, J. J. MOORE & CO., INC., Agents

LAURITZEN LINE
(J. Lauritzen—Copenhagen, Denmark)
See, LLOYD SHIPPING CO., Agents

LEIF HOEGH, OSLO
See, KERR STEAMSHIP COMPANY, INC., Agents

LLOYD SHIPPING COMPANY **AGENTS**
206 Sansome Street **GArfield 1973**
Eugene C. Lloyd, President
Guy E. M. Steacy, Freight Agent
Agents For:
GIRDWOOD SHIPPING CO.
LAURITZEN LINES
LLOYD LINE
Service To:
Mexico, Central America, Panama

LUCKENBACH GULF STEAMSHIP CO., INC.
100 Bush Street **SUtter 8711**

LUCKENBACH STEAMSHIP CO., INC.
100 Bush Street **SUtter 8711**
V. P. McMurdo, Acting Pacific Coast Mgr.
W. G. Perow, Pacific Coast Marine Supt.
Ira Head Asst. Pacific Coast Marine Supt.
H. F. Clifford, Pacific Coast Auditor
J. T. Bolts, Pacific Coast Purchasing Agent
D. R. O'Neill, Pacific Coast Port Steward
W. H. Conradi, Pier Superintendent
J. H. Weller, Stevedoring Superintendent
Service To:
North Atlantic Service from Seattle, Portland, Stockton, Oakland - Alameda, San Francisco, Los Angeles Harbor to New York, Philadelphia and Boston. Gulf Service between Seattle, Portland, Stockton (Eastbound), San Francisco and Los Angeles Harbor—New Orleans, Houston, Mobile and Tampa via Panama Canal

MARINE TRANSPORT LINES, INC.
510 Battery Street **DOuglas 1366**
K. F. Watterworth, General Manager
L. Vansistine, Purchasing Agent
Capt. Otto Davis, Port Captain
Fred D. Deckard, Port Engineer
Thomas L. Seale, Port Steward
Agents For:
POLARIS STEAMSHIP COMPANY
Service To:
World-wide Service
Tankers, Freighters

MARTIN, C. U. **AGENT**
465 California Street **EXbrook 7140**

MOORE-McCORMACK LINES, INC.
(Pacific Republics Line)
140 California Street **GArfield 7121**
K. C. Tripp, Pacific Coast Manager
H. Martin, Port Engineer
R. E. Moon, Port Captain
A. J. Gartland, Purchasing Agent
J. Hartry, Port Steward
R. M. Despammler, Auditor
H. K. Grady, Western Freight Traffic Mgr.
H. R. Cawsey, Passenger Agent
Service To:
East Coast South America

MATSON NAVIGATION CO.
215 Market Street **DOuglas 5233**
Frazer A. Bailey, President
Hugh Gallagher, Vice President
G. K. Nichols, Vice Pres. in chg. of Construction & Repair Dept.
S. G. Walton, Vice President
R. P. Hasenauer, Treasurer
H. B. Perrin, Secretary
J. P. Thompson, Manager, Construction & Repair
M. Price, Manager, Insurance Dept.
A. M. McKelligon, Purchasing Agent
Paul Hodges, Manager, Public Relations
A. J. Haring, Service Manager
Commodore C. A. Berndtson, Marine Supt.
Capt. M. C. Stone, Port Captain
R. H. Sample, Port Engineer
R. DeGorog, Catering Supt.
M. F. Cropley, Freight Traffic Manager
G. F. Hansen, Passenger Traffic Manager
A. B. Tichenor, Industrial Relations Manager
J. H. Jansen, Terminals Manager

McCORMICK STEAMSHIP CO.
(Pacific Republics Line)
See, POPE & TALBOT, INC.

MOORE, J. J., & CO. **AGENTS**
451 Montgomery Street **GArfield 7480**
H. B. Adams, Vice Pres. and Oper. Mgr.
J. C. Morrison, Exec. Vice President
A. O. Snaider, Freight Traffic Mgr.
Agents For:
LATIN-AMERICAN LINE
(West Coast of South America)
SOUTH AFRICAN DISPATCH LINE
(South Africa)
AUSTRALIAN DISPATCH LINE
(Australia)

MOSVOLD LINE
See, HOLWAY S. S. CO., Agents

NAVIERA AZNAR, S.A., BILBAO
See, KERR STEAMSHIP COMPANY, INC., Agents

NICOL, R. A., & CO., INC.
See, DE LA RAMA STEAMSHIP CO., INC., THE, Agents

NORTON, LILLY & CO. **AGENTS**
230 California Street **SUtter 3600**
Lines:
AMERICAN MANCHURIAN LINE
ELLERMAN & BUCKNALL S.S. CO., LTD.
AMERICAN SOUTH AFRICAN LINE
UNION SULPHR CO., LTD.
FOSS LAUNCH & TUG CO.

NORWEGIAN AMERICA LINE AGCY., INC.
323 Geary Street

OCEAN AGENCIES, LTD. **AGENTS**
465 California Street **EXbrook 1321**
H. E. Pickering, President
L. J. Pepperell, Vice President & Gen. Mgr.
Agents For:
W. H. WICKERSHAM & CO., INC.

OCEANIC STEAMSHIP CO.
215 Market Street **DOuglas 5233**
See, MATSON NAVIGATION CO., Agents
To:
Hawaii, Samoa, Fiji, New Zealand, Australia.

OLSEN, FRED, LINE AGENCY, LTD.
241 California Street EXbrook 2261
Harald Muller, President
Jens Feragen, Vice Pres.-General Mgr.
M. S. Bannatyne, Secretary-Traffic Mgr.

OLSON, OLIVER J., & CO., INC.
260 California Street DOuglas 0915
E. Whitney Olson, President
George L. Olson, Exec. Vice President
L. E. Phillips, Vice Pres. (Portland)
Oliver J. Olson, Jr., Secretary
John Pettebone, Office Manager
A. C. Musante, Insurance Official
F. A. Stromberg, Purchasing Agent
Jack C. Winters, Port Engineer
Ray E. Baker, Asst. Port Engineer
F. A. Stromberg, Port Steward
Agents For:
U. S. MARITIME COMMISSION
Service To:
Pacific Coastwise Lumber carriers only

OLYMPIC STEAMSHIP CO., INC.
64 Pine Street DOuglas 0880
J. C. Strittmatter, Exec. Vice Pres.
D. M. Gregory, Director for Traffic
E. H. Johannsen, General Freight Agent
John Berg, Dist. Operating Mgr.
M. A. Johnston, Port Engineer
D. R. McGath, Purchasing Agent
Wm. Gleason, Port Purser
Geo. Stephens, Port Steward
Agents For:
ALASKA TRANSPORTATION CO.
COASTAL STEAMSHIP CO.
Service To:
Complete Pacific Coastwise Service

PACIFIC AMERICAN SHIPOWNERS ASSOCIATION EXbrook 3913
405 Montgomery Street
J. B. Bryan, President
W. L. C. Brown, Secretary

PACIFIC AMERICAN STEAMSHIP ASSN.
405 Montgomery Street EXbrook 3913
E. Russell Lutz, President
Hugh Gallagher, Vice Pres.
W. Dearborn Clark, Vice Pres.
Ralph J. Candler, Vice Pres. at Los Angeles
Hillman Lueddemann, Vice Pres. at Portland
A. R. Lintner, Vice Pres. at Seattle
Henrietta T. Smith, Secretary-Treasurer
Albert W. Gatov, Executive Director

PACIFIC-ATLANTIC STEAMSHIP CO.
214 Front at California Street EXbrook 3414
Agents For:
QUAKER LINE

PACIFIC-AUSTRALIA DIRECT LINE
(Transatlantic Rederi A/B—Gothenburg Sweden)
See, GENERAL STEAMSHIP CORP., Agents
Service:
Sydney, Melbourne, Adelaide

PACIFIC FAR EAST LINE, INC.
256 Montgomery Street EXbrook 7605
W. T. Sexton, President
Thomas E. Cuffe, Vice Pres. & Gen. Mgr.
E. V. Nevin, Secty-Treas.
J. J. Presser, Purchasing Agent
W. T. Lion, Port Captain
V. J. Bahorich, Supt. Engineer
V. R. Andrus, Port Steward
J. R. Wagner, Traffic Mgr.
A. F. Maze, Passenger Agent

PACIFIC ISLANDS TRANSPORT LINE
(Aktieselskabet Thor Dahl, Sandefjord, Norway)
See, GENERAL STEAMSHIP CORP., Agents
Service:
South Seas and New Caledonia

PACIFIC COAST DIRECT LINE
(Weyerhaeuser S. S. Co.—Newark, N.J.)
See, INTEROCEAN STEAMSHIP CORP., Agents

PACIFIC MAIL STEAMSHIP COMPANY
311 California Street EXbrook 8454
R. H. Andersen, President
R. Stanley Dollar, Vice President
J. M. Fisher, Secretary-Treasurer
E. E. Daniels, Marine Supt.

PACIFIC MEDITERRANEAN LINE
See, GENERAL STEAMSHIP CORP., LTD., Agents

PACIFIC ORIENT EXPRESS LINE
See, GENERAL STEAMSHIP CORP., LTD., Agents

PACIFIC REPUBLICS LINE
140 California Street GArfield 7121

PACIFIC TANKERS, INC.
433 California Street DOuglas 8616
K. D. Dawson, President
W. T. Sexton, Vice President
Allen Cameron, General Manager
Arthur A. Layne, Secretary-Treasurer
H. E. Hedrick, Asst. Sec.-Treas.
Chester E. McKay, Superintending Engineer
Capt. Frank J. Morrison, General Supt.
Earl Hoffman, Purch. Agent
J. Malcolm Baird, Personnel Manager
C. M. Cox, Traffic Manager
H. O. Faber, Port Captain
Joseph Jadrich, Port Steward

PACIFIC TRANSPORT LINES, INC.
244 California Street DOuglas 8174
Richard A. McLaren, President
Jesse B. McCargar, Vice President
James L. Adams, Traffic Manager
Hiram V. Walker, Traffic Manager
James O. McManus, Operating Manager
Ray A. Johanson, Insurance Official
Paul B. Babcock, Purchasing Agent
A. J. Ederer, Port Engineer
Paul B. Babcock, Port Steward
Paul H. Matson, Freight Agent
Service To:
Shanghai, Hong Kong, Philippines

PARRY NAVIGATION C., INC.
112 Pine Street SUtter 2852
Chas. A. Perkes, Pacific Coast Manager
Carleton F. Lester, Assistant Manager
Capt. J. M. Mortenson, Port Captain
William M. Gough, Port Engineer
Thomas J. Taylor, Port Steward
Paul F. Mott, Purchasing Agent
Charles J. Moroney, Port Purser
Anthony L. Weicher, Insurance & Claims
Kenneth Griffin, Accountant
Agents For:
PARRY LINES, INC.
AMERICAN EXPORT LINES, INC.
DICHMANN, WRIGHT & PUGH, INC.

PENINSULAR & ORIENTAL LINE
See, CUNARD WHITE STAR LIMITED, Agents

PIONEER LINE
Pier 5 SUtter 3934
W. G. Westman, Operating Manager
C. R. Escher, Traffic Manager
Service:
San Francisco, Oakland, Alameda, Mare Island Navy Yard, So. Vallejo, Oleum, Selby, Crockett, and other Bay and River Points.

POLARIS STEAMSHIP CO.
See, MARINE TRANSPORT LINES, INC., Agents

POPE & TALBOT, INC.
320 California Street DOuglas 2561
Geo. A. Pope, Jr., President
Chas. L. Wheeler, Exec. Vice Pres.
F. C. Talbot, Vice President
E. N. W. Hunter, Acting Gen. Mgr.
Jos. L. Paiva, Controller
R. F. Burley, Freight Traffic Mgr.
T. F. Luedtke, Asst. Frgt. Traffic Mgr.
H. T. Dupont, Asst. Secretary
M. C. Darr, Auditor
E. C. Elwood, Purch. Agent (Pier 40)
W. S. Lewis, Claims & Insurance
Harry Strittmatter, Terminal Agent (Pier 40)
John Clerico, Port Engineer (Pier 40)
Capt. B. H. Tietjen, Port Captain (Pier 40)
E. H. Harms, Oper. Manager
E. M. Blank, Port Steward
Agents For:
ALCOA STEAMSHIP CO.
INTERNATIONAL FREIGHTING CORP.
PRUDENTIAL STEAMSHIP CO.
SMITH & JOHNSON
J. T. STEVENSON & CO., INC.
STOCKARD STEAMSHIP CO.
UNITED STATES NAVIGATION CO.
WESSAL DUVAL CO.
Presently operating intercoastal service for USMC, with sailings approximately every 18 days. Westbound sailings from Chester and Philadelphia, Baltimore, Norfolk. Eastbound service to Baltimore for general merchandise; also Newark, N. J., and Brooklyn for lumber
Presently operating monthly sailings from Pacific Coast to Puerto Rico for USMC
Weekly sailings coastwise for USMC

PORT LINE LIMITED
See, CUNARD WHITE STAR LIMITED, Agents

PRINCE LINE
See, FURNESS (PAC.) LTD., Agents

PRINCE-SILVER ROUND WORLD SERVICE
See, KERR STEAMSHIP COMPANY, INC., Agents

PRUDENTIAL STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

QUAKER LINE
See, PACIFIC-ATLANTIC STEAMSHIP CO., STATES STEAMSHIP CO.

RIVER LINES, THE
Pier 3 SUtter 3880
N. A. Fay, Vice Pres. & Gen. Mgr.
J. H. Anderson, Traffic Mgr.
R. M. Clare, Operating Manager

RICHFIELD OIL CORPORATION
333 Montgomery Street DOuglas 2815
Lee B. Johnstone, Mgr. Marine Sales

ROYAL MAIL LINES
See, HOLLAND-AMERICAN LINES, Agts.

SALEN LINE
See, INTEROCEAN STEAMSHIP CORP., Agents

SAN FRANCISCO BAR PILOTS
Pier 7 DOuglas 5436

SEAS SHIPPING CO.
See, WILLIAMS, DIMOND & CO., Agents

SHARP, C. F., & CO., INC. AGENTS
230 California Street YUkon 6-1654
Chester F. Sharp, Chairman
A. V. Rocha, President
A. S. Lonnberg, Manager
Agents For:
IVARIAN LINES
WATERMAN STEAMSHIP CORP.
Service To:
Far East

SHEPARD STEAMSHIP CO.
369 Pine Street EXbrook 6974
F. C. Ninnis, District Manager (Calif.)
J. W. Dopp, Port Captain
C. Bramlord, Port Engineer
C. Martin, Port Steward
H. Bostwick, Purchasing Agent

SHIPOWNERS ASSOCIATION OF THE PACIFIC COAST
Ralph W. Meyers, President
George Olsen, Secretary

SILVER-JAVA PACIFIC LINE
(Stanley & John Thompson, Ltd.—London & N.Y.; Stoomvaart Maat-chappy — Nederland, Rotterdam)
See, KERR STEAMSHIP CO., INC., and TRANSPACIFIC TRANSPORTATION CO., Agents

SILVER LINE, LTD.
See, KERR STEAMSHIP CO., INC., and FURNESS (Pacific), LTD., Agents

SMITH & JOHNSON
See, POPE & TALBOT, INC., Agents

STANDARD OIL COMPANY OF CALIF.
225 Bush Street SUtter 7700
R. G. Follis, President
J. H. MacGaregill, Vice President
E. J. McClanahan, Vice President
J. E. Black, Manager For. Tr. Depot
J. L. Hanna, Vice Pres. in Chg. Mar. Affairs
J. H. McEachern, Mgr. Marine Dept.
W. C. Lane, Asst. Manager For. Tr. Depot
E. J. Macfarlane, Assistant to Manager
A. E. Kihn, Asst. Mgr. Marine Dept.
B. A. Young, Superintending Engineer
M. H. Jaehne, Naval Architect
Capt. J. A. Rumsey, Mar. Supt., Richmond
Capt. A. C. Nelson, Mar. Supt., Estero Bay
Capt. T. W. Peters, Mar. Supt., San Pedro-El Segundo
L. Simonson, Marine Supt., Point Wells, Washington
Service:
Pacific Coastwise, Alaska, Hawaiian Islands and Offshore (Private Carriers)

STATES STEAMSHIP CO.
214 Front St. at California St. EXbrook 3414
Agents For:
QUAKER LINE

STEVENSON, J. T., & CO., INC.
See, POPE & TALBOT, INC., Agents

STOCKARD STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

SOUTH AFRICAN DISPATCH LINE
See, J. J. MOORE & CO., Agents

SOUTH ATLANTIC STEAMSHIP CO.
See, WILLIAMS, DIMOND & CO., Agents

SWEDISH AMERICAN LINE
760 Market Street GArfield 2811
Herbert Seebohm, District Manager
Agents For:
GOTA CANAL STEAMSHIP CO.
Service To:
New York—Gothenburg
Canal Passage—Gothenburg—Stockholm

SUDDEN & CHRISTENSON, INC. AGENTS
310 Sansome Street GArfield 2846
Capt. R. O. Demarest, Oper. Manager
Louis Depemann, Port Engineer
C. Olson, Port Captain
Lines:
ARROW LINE
KLAVENESS LINE
ARROW STEVEDORE CO.

SUDDEN & CHRISTENSON OVERSEAS CORP.
310 Sansome St. GArfield 2846
Agents For:
BARBER S. S. LINES

TEXAS COMPANY, THE
Hearst Building GArfield 0728

THORNLEY & PITT
520 Battery Street GArfield 3536
C. J. Madsen
N. C. Unfug
Geo. H. Pitt
Agents For:
KEYSTONE SHIPPING CO.
ATLANTIC REFINING CO.

TIDE WATER ASSOCIATED OIL CO.
79 New Montgomery Street EXbrook 4800
William F. Humphrey, Chairman & Pres.
H. B. Haney, Manager of Transportation
H. J. Wilson, Manager, Marine Department
O. Lundin, Asst. Mgr., Marine Department
H. C. Ruf, Chief Engineer
D. L. Rigden, Port Engineer
S. H. Harrison, Asst. Port Engineer
W. E. Kammerer, Office Mgr. and Vessel Dispatcher
H. Shapira, Asst. Vessel Dispatcher
F. R. Starrs, Port Steward

TRANSATLANTIC STEAMSHIP CO.
See, GENERAL STEAMSHIP CORP., Agents

TRANSPACIFIC TRANSPORTATION CO.
149 California Street AGENTS
YUkon 0786
Cornelius Winkler, President
E. L. Bargones, Vice Pres. & Gen. Mgr.
Harold Taft, Traffic Manager
Lines:
SILVER-JAVA PACIFIC LINE

UNION OIL CO. OF CALIFORNIA
425 First Street SUtter 1400

UNION STEAM SHIP CO. OF NEW ZEALAND, LTD.
230 California Street YUkon 1866
S. B. Pilcher, Manager
Service To:
New Zealand, Australia & South Seas

UNITED FRUIT CO. AGENT
1001 Fourth Street GArfield 4040
C. D. Daswell, Pacific Coast Manager
H. P. Champlain, Marine Superintendent
J. T. O'Neill, Purch. Agent
Frank Cook, Freight Agent

UNITED STATES LINES CO.
222 Sansome Street DOuglas 8680
K. D. Dawson, Vice President
W. T. Sexton, Pacific Coast Manager
J. A. Barthrob, Pac. Coast Freight Traffic Mgr.
Agent For:
COASTWISE LINE
AMERICAN PIONEER LINE
PANAMA PACIFIC LINE
Service:
Intercoastal and European, Australia, Far East

UNITED STATES NAVIGATION CO.
See, POPE & TALBOT, INC., Agents
AMERICAN PIONEER LINE
PANAMA PACIFIC LINE

WATERMAN STEAMSHIP CORP.
See, C. F. SHARP & CO., INC., Agents

WESSAL DUVAL CO.
See, POPE & TALBOT, INC., Agents

WEST COAST LINE
See, WILLIAMS, DIMOND & CO., Agents

WESTFAL-LARSEN CO. LINE
See, GENERAL STEAMSHIP CORP., Agents
Service:
Between Pacific Coast and East Coast of South America.

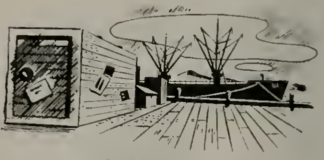
WEYERHAEUSER LINE
(Pacific Coast Direct Line, Inc.; Weyerhaeuser S. S. Co.—Newark, N. J.)
See, INTEROCEAN STEAMSHIP CORP., Agents

W. H. WICKERSHAM & CO., INC.
See, OCEAN AGENCIES, LTD., Agents

WILLIAMS, DIMOND & CO.
260 California Street SUtter 0525
E. J. McCormick, President
F. J. Kugelberg, Vice President
H. W. Poett, Secretary
Agents For:
SEAS SHIPPING CO.
A. H. BULL & CO.
SOUTH ATLANTIC STEAMSHIP CO.
EASTERN STEAMSHIP CO., INC.
BLACK DIAMOND STEAMSHIP CO.
WILMORE STEAMSHIP CO.
AMERICAN REPUBLICS CORP.
WEST COAST LINE

WILMORE STEAMSHIP CO.
See, WILLIAMS, DIMOND & CO., Agents

OREGON



PORTLAND

AFRICA-ASIA LINE
See, GRIFFITH TRANSPORT CO., Agents

AGWILINES, INC.
See, INTEROCEAN S. S. CORP., Agents

ALASKA PACKERS ASSOCIATION
See, J. J. MOORE & CO., Agents

ALASKA STEAMSHIP CO.
See, LIDELL & CLARKE, Agents

ALASKA TRANSPORTATION CO.
See, AMERICAN MAIL LINE, LTD., Agents

ALCOA STEAMSHIP CO.
See, POPE & TALBOT, INC., Agents

ALEXANDER & BALDWIN, LTD. **AGENTS**
327 S. W. Pine **ATwater 4386**
R. L. Kingsbury, Manager
Lines:
MATSON NAVIGATION CO.
OCEANIC S. S. CO.
(New Zealand & Australian Service)
INTER-ISLAND STEAM NAVIGATION CO.

AMERICAN-HAWAIIAN S. S. CO.
Railway Exchange Building **ATwater 8536**
F. N. Mills, District Manager
H. L. Hamilton, Shipping Master
E. L. Graham, Asst. to Dist. Mgr.
W. D. Anderson, Asst. to Dist. Mgr.

AMERICAN LIBERTY S. S. CORP.
See, INTEROCEAN S. S. CORP., Agents

AMERICAN-PACIFIC STEAMSHIP CO., INC.
See, GENERAL STEAMSHIP CORP., Agents

AMERICAN MAIL LINE **AGENTS**
520 Pacific Building **BRoadway 5447**
W. L. Williams, Manager
W. E. Ferrari, Purchasing Agent
D. G. Page, Dist. Operating
C. R. Toole, Port Engineer
H. C. Ashton, Freight Agent
Agents For:
LYKES BROS. S. S. CO.
HAMMOND SHIPPING CO.
ALASKA TRANSPORTATION CO.
NORTHLAND TRANSPORTATION CO.
Service To:
Philipine Islands, China and Japan

AMERICAN PRESIDENT LINES, LTD.
1788 Front Avenue

ARROW LINE
Henry Building **ATwater 3316**

AUSTRALIAN DISPATCH LINE
See, J. J. MOORE & CO., Agents

BALFOUR, GUTHRIE & CO. LTD.
733 S. W. Oak **AGENTS**
ATwater 9441
D. W. L. MacGregor, Vice President
G. C. Fortune, Vice Pres.
R. F. Shepherd, Mgr. Import Dept.
D. S. Cameron, Mgr. S. S. Dept.
James A. Dick, Mgr. Marine Insurance Dept.
Lines:
DONALDSON LINE

BARBER STEAMSHIP LINES, INC.
See, COASTWISE (PAC. FAR EAST) LINE, Agents

BLACK DIAMOND STEAMSHIP CORPORATION
See, WILLIAMS, DIMOND & CO., Agents

BULL, A. H., & CO.
See, WILLIAMS, DIMOND & CO., Agents

BURCHARD & FISKEN, INC. **AGENTS**
Board of Trade Building **ATwater 9501**
W. D. Hazen, Portland Manager
Lines:
FURNESS LINE
(Furness (Pacific) Limited)
EAST ASIATIC CO., INC.
JAVA PACIFIC LINE
UNION S. S. CO. OF N. Z., LTD.
Service To:
China, Europe, United Kingdom, Philippine Islands, Straits Settlements, Netherlands East Indies, India, Persian Gulf, South Africa, East Africa, New Zealand, Australia.

CANADIAN AUSTRALASIAN LINE
626 S. W. Broadway **MAin 0637**

CANADIAN PACIFIC S. S. CO.
626 S. W. Broadway **BRoadway 0637**
E. J. Dahlberg, City Passenger Agent
C. W. Laird, District Freight Agent
626 S. W. Broadway

CHAMBERLIN, W. R., & CO.
Board of Trade Building **BRoadway 0406**

COASTWISE (PACIFIC FAR EAST) LINE
1788 N. W. Front Avenue **BRoadway 7301**
Agents For:
BARBER STEAMSHIP LINES INC.

DECONHIL SHIPPING CO.
Board of Trade Building

DONALDSON LINE
See, BALFOUR, GUTHRIE & CO., LTD., Agents

EAST ASIATIC CO., INC.
See, BURCHARD & FISKEN, INC., Agents

EASTERN STEAMSHIP LINES, INC.
See, WILLIAMS, DIMOND & CO., Agents

FRENCH LINE
See, GENERAL S. S. CORP., LTD., Agents

FRUIT EXPRESS LINE
See, PAGE BROTHERS, INC., Agents

FURNESS (PACIFIC) LIMITED
See, BURCHARD & FISKEN, INC., Agents

GENERAL PETROLEUM CORP.
P. O. Box 6118 **UNiversity 1605**
Portland 9, Oregon
M. H. Schmokel, Oper. (Dist.) Mgr.
Lew Barnes, Purchasing Agent
D. A. Younger, Superintendent
J. P. Dillon, Yard Foreman

GENERAL STEAMSHIP CORP., LTD.
Lewis Building **AGENTS**
ATwater 7214
V. A. Driscoll, District Manager
E. E. Anderson, District Passenger Agent
E. G. Carlson, Traffic Dept. Manager
W. B. Smith, Traffic Dept.
Spencer Gorham, Documentation and Claims
Agents For:
PACIFIC ORIENT EXPRESS LINE
KERR-SILVER LINES
PACIFIC-AUSTRALIA DIRECT LINE
PACIFIC ISLANDS TRANSPORT LINE
AMERICAN-PACIFIC S. S. CO., INC.
WESTFAL-LARSEN LINE
INDEPENDENCE LINE
PACIFIC-MEDITERRANEAN LINE
FRENCH LINE
Service To:
Shanghai, Tsingtao, Taku Bar and Other North China Ports; Philippines, Straits Settlements, Dutch East Indies, India, Persian Gulf, South African Ports; Australia and New Zealand Ports; West and East Coasts of South America; Central America, Panama, Colombia and South America; Pacific Coast to Mediterranean Ports; Pacific Coast to French and North European Pors.

GRACE LINE
See, LIDELL & CLARK, Agents

GRIFFITH TRANSPORT COMPANY
709 Dekum Building **AGENTS**
ATwater 9486
E. J. Griffith, President
W. A. Allen, Secretary
R. E. Tetherow, Treasurer
Agents For:
AFRICA-ASIA LINE
STAN LINE
Service To:
South Africa, India and Oriental Ports.

HAMMOND SHIPPING CO.
See, AMERICAN MAIL LINE, LTD., Agents

HILLCONE STEAMSHIP CO.
Board of Trade Building

HOLLAND-AMERICA LINE
See, NORPAC SHIPPING CO., INC., Agents

INDEPENDENCE LINE
See, GENERAL S. S. CORP., LTD., Agents

INTER-ISLAND STEAM NAVIGATION CO.
See, ALEXANDER & BALDWIN, LTD., Agents

INTEROCEAN LINE
See, INTEROCEAN S. S. CORP., Agents

INTEROCEAN STEAMSHIP CORP.
Board of Trade Building **AGENTS**
BEacon 4174
A. C. Nielsen, Dist. Mgr.
R. G. Jubitz, Traffic Mgr.
G. H. Riggs, Operations
Agents For:
INTEROCEAN LINE
KNUTSEN LINE
SALEN LINE
PACIFIC COAST DIRECT LINE
WEYERHAEUSER S. S. CO.
AGWILINES INC.
AMERICAN LIBERTY S. S. CORP.
Service To:
Havre, Rotterdam, Manila, Shanghai, Hong Kong, Baltimore, Philadelphia, Norfolk.

ISTHMIAN S. S. CO.
1117 Board of Trade Bldg. **BEacon 3126**
S. E. Shields, Dist. Mgr.
G. P. Abingdon, Pier Agent
Service To:
World-wide.

JAVA PACIFIC LINE
See, BURCHARD & FISKEN, INC., Agents

JOHNSON LINE
See: LIDELL & CLARK, Agents

KERR-SILVER LINES
See, GENERAL S. S. CORP., LTD., Agents

KEYSTONE SHIPPING COMPANY
Board of Trade Building

KLAVENESS LINE
Henry Building **ATwater 3316**

KNUTSEN LINE (S. A. SERVICE)
See, INTEROCEAN S. S. CORP., Agents

LATIN-AMERICAN LINE
See, J. J. MOORE & CO., Agents

LIDELL & CLARK AGENTS
Board of Trade Building **ATwater 8508**
Geo. G. Clarke, President
Roy Albers, Traffic Manager
Lines:
JOHNSON LINE
ALASKA STEAMSHIP CO.
GRACE LINE

LUCKENBACH STEAMSHIP CO., INC.
1201 Public Service Building ATwater 8371
Also: Luckenbach Gulf Steamship Co., Inc.
R. E. Piper, District Manager
A. M. Hendrickson, Dist. Claim Agent
H. C. Chadbourne, Cashier
R. R. Steele, Marine Supt.
Service To:
North Atlantic — New York, Boston, Philadelphia, Providence
Gulf—New Orleans, Mobile, Houston, Tampa

LYKES BROS. S. S. CO.
See, AMERICAN MAIL LINE, LTD., Agents

MARINE TRANSPORT LINES, INC.
See, WILLIAMS, DIMOND & CO., Agents

MATSON NAVIGATION CO.
See, ALEXANDER & BALDWIN, LTD., Agents

MOORE, J. J., & CO. AGENTS
918 Board of Trade Bldg. **ATwater 8201**
Capt. H. C. Neilson, Oper. (Dist.) Mgr.
H. H. Wood, Traffic Manager
Agents For:
LATIN-AMERICAN LINE
SOUTH AMERICAN DISPATCH LINE
AUSTRALIAN DISPATCH LINE
ALASKA PACKERS ASSOCIATION
Service To:
West Coast of South America, South Africa, Australia.

MOORE McCORMACK LINES, INC.
Behnke-Walker Building **ATwater 7241**
E. F. Sweeney, Manager
R. Ornduff, Jr., Operating Manager
A. J. Gartland, Purchasing Agent

MORAN TOWING & TRANSPORTATION CO.
See, WILLIAMS, DIMOND & CO., Agents

NORPAC SHIPPING CO., INC.
Lewis Building AGENTS
BEacon 6207
James McDonald, President
A. H. Gattie, Vice Pes. & Gen. Mgr.
H. B. Beckett, Secretary
E. W. Basye, Asst. Secretary
C. E. Hodges, Superintendent
Agents For:
ROYAL MAIL LINES, LTD.
HOLLAND AMERICA LINE
Service To:
United Kingdom and Continent

NORTHLAND TRANSPORTATION CO.
See, AMERICAN MAIL LINE, LTD., Agents

NORTON LILLY & CO.
Board of Trade Bldg. **BRoadway 0683**

OCEANIC S. S. Co.
(New Zealand and Australia Service)
See, ALEXANDER & BALDWIN, LTD., Agents

OLSON, OLIVER J., & CO.
1020 N. W. Front

PACIFIC-ATLANTIC S. S. CO.
See, PACIFIC-ATLANTIC S. S. CO.
VANCOUVER, WASH.

PACIFIC-AUSTRALIA DIRECT LINE
See, GENERAL S. S. CORP., LTD., Agents

PACIFIC COAST DIRECT LINE
See, INTEROCEAN S. S. CORP., Agents

PACIFIC-MEDITERRANEAN LINE
See, GENERAL S. S. CORP., LTD., Agents

PACIFIC ORIENT EXPRESS LINE
See, GENERAL S. S. CORP., LTD., Agents

PAGE BROTHERS, INC. AGENTS
224-226 Board of Trade Bldg. **BEacon 4811**
Harald Carl, President
Norman Lauritz, Vice President
Agents For:
FRUIT EXPRESS LINE
Service To
United Kingdom, Continent and Scandinavia.

POPE AND TALBOT, INC.
618 N. W. Front **ATwater 9161**
H. Lueddemann, Vice Pres. & No'west Mgr.
Cyrus T. Walker, Asst. to Vice Pres.
C. E. Collins, Dist. Manager
W. E. Whitcomb, Gen'l Frt. Agent
B. E. Hearn, Dist. Purch. Agent
Agents For:
ALCOA STEAMSHIP CO.
UNITED FRUIT COMPANY
Services:
Pacific Coastwise, Intercoastal, Puerto Rico

PARRY NAVIGATION CO.
See, TRANSOCEAN SHIPPING CO., Agents

RICHFIELD OIL CORPORATION
Linnton

ROBIN LINE (Seas Shipping Co.)
See, WILLIAMS, DIMOND & CO., Agents

ROUNTREE, W. J., CO., INC.
See, WILLIAMS, DIMOND & CO., Agents

ROYAL MAIL LINES, LTD.
See, NORPAC SHIPPING CO., INC., Agents

SALEN LINE
See, INTEROCEAN S. S. CORP., Agents

SEAS SHIPPING CO. (Robin Line)
See, WILLIAMS, DIMOND & CO., Agents

SHEPARD STEAMSHIP CO.
Builders Exchange Bldg. **ATwater 9378**
J. T. Cornell, Pac. Coast Mgr.
Earl Sanders, N. W. Operating Manager

SOUTH AFRICAN DISPATCH LINE
See, J. J. MOORE & CO., Agents

SOUTH ATLANTIC STEAMSHIP LINE
See, WILLIAMS, DIMOND & CO., Agents

STAN LINE
See, GRIFFITH TRANSPORT CO., Agents

STATES STEAMSHIP CO.
See, Under Vancouver, Wash.

STEEB, J. T., & CO., INC. AGENTS
Board of Trade Building

SUDDEN & CHRISTENSON, INC.
Henry Building **ATwater 3316**

TEXAS COMPANY, THE
3640 N. W. St. Helens

TIDE WATER ASSOCIATED OIL CO.
Pittock Block
C. R. Clark, Dist. Sales Mgr.
Terminal—Linnton
F. Kelly, Plant Supt.

TRANSATLANTIC S. S. CO., LTD.
Lewis Building **ATwater 7214**

TRANSOCEAN SHIPPING CO.
Lewis Bldg. **BRoadway 1322**
Agents For:
PARRY NAVIGATION CO., INC.

UNION OIL CO. OF CALIFORNIA
Yeon Building

UNION STEAMSHIP CO. OF NEW ZEALAND, LTD.
See, BURCHARD & FISKEN, INC., Agents

UNITED FRUIT COMPANY
See, POPE & TALBOT, Agents

WESTFAL-LARSEN LINE
See, GENERAL S. S. CORP., LTD., Agents

WEYERHAEUSER LINE
See, INTEROCEAN S. S. CORP., Agents

WILLIAMS, DIMOND & CO.
Railway Exchange Building **ATwater 8536**
F. N. Mills, District Manager
W. D. Anderson, Asst. to District Mgr.
E. L. Graham, Asst. to District Mgr.
H. L. Hamilton, Shipping Master
E. F. Weiss, Stevedore Superintendent
Agents For:
BLACK DIAMOND STEAMSHIP CORP.
A. H. BULL & CO.
EASTERN STEAMSHIP LINES, INC.
MARINE TRANSPORT LINES, INC.
MORAN TOWING & TRANSPORTATION CO.
ROUNTREE, W. J., CO., INC.
SEAS SHIPPING CO. (Robin Line)
SOUTH ATLANTIC STEAMSHIP LINE
WILMORE STEAMSHIP CO.

WILMORE STEAMSHIP CO.
See, WILLIAMS, DIMOND & CO., Agents

WASHINGTON

SEATTLE

AGWILINES, INC.
See, INTEROCEAN S. S. CORP., Agents

ALASKA PACKERS ASSOCIATION
See, J. J. MOORE & CO., Agents

ALASKA STEAMSHIP CO.
Piers 50 and 51 MAin 4530
G. W. Skinner, President
Lawrence Bogle, 1st Vice President
L. W. Baker, V. P. and Gen. Mgr.
J. W. Killingsworth, Secretary
W. P. McCarthy, Auditor (Insurance Official)
C. O. Nelson, Purchasing Agent
J. Fred Zumdieck, Marine Supt.
R. A. Johnson, Port Captain
M. W. Felton, Port Engineer
W. C. Hubbard, Port Steward
H. N. Peterson, Pass. Traffic Mgr.
J. D. Nelson, Freight Traffic Mgr.
W. E. Brown, General Frt. & Pass. Agent
Service To:
All Alaska Ports: Ketchikan, Juneau, Cordova, Valdez, Seward, Seldovia, Kodiak, Nome.

ALASKA TRANSPORTATION CO.
Pier 58 MAin 7477
J. A. Talbot, President
Norton Clapp, 1st V. P. & Secty.
S. J. Swanson, 2nd V. P. & Gen. Mgr.
E. W. Hundley, Oper. (Dist.) Mgr.
George Guerin, Purchasing Agent
D. Ethier, Port Captain
J. H. Hearing, Port Engineer
Agents For:
U. S. MARITIME COMMISSION
Service To:
Ketchikan, Juneau, Haines, Pelican, Skagway, Sitka, and Other Ports.

ALCOA STEAMSHIP CO.
See, POPE & TALBOT LINES, Agents

ALEXANDER & BALDWIN, LTD. AGENTS
814 Second Avenue MAin 3677
Melville McKinstry, Seattle Manager
E. T. Collins, Port Captain
H. R. Farwell, Freight Agent
C. J. Stettin, Passenger Agent
Agents For:
MATSON NAVIGATION CO.
Service To:
Hawaii.

AMERICAN EXPORT LINES, INC.
See, AMERICAN MAIL LINE, LTD.
Agents

AMERICAN-HAWAIIAN STEAMSHIP CO.
1305 Vance Building AGENTS
ELiot 8120
H. M. Burke, District Manager
Dick Streets, Port Engineer
O. L. Brownell, Asst. Dist. Mgr.
Agents For:
U. S. M. C. AND OWN VESSELS
Service To:
Intercoastal. North Atlantic: New York, Philadelphia, Boston. South Atlantic: Puerto Rico, Jacksonville, Savannah, Charleston, Wilmington, N. C., Norfolk, Baltimore.

AMERICAN MAIL LINE, LTD. AGENTS
740 Stuart Building SEneca 4400
A. R. Lintner, President
R. J. Reynolds, Earl D. Doran, Ross McIntyre, Vice Presidents
S. L. Barnes, Secretary
R. B. Bush, Treasurer
G. J. Ackerman, Operating Manager
S. E. Fleming, Purchasing Agent
A. F. Raynaud, Port Captain
F. H. Howard, Port Engineer
William Klontz, Port Steward
H. T. Krull, Traffic Manager
William Ross, Passenger Agent
Agents For:
LYKES BROS. S. S. CO., INC.
HAMMOND SHIPPING CO., LTD.
AMERICAN EXPORT LINES, INC.
ALASKA TRANSPORTATION CO.
NORTHLAND TRANSPORTATION CO.
DECHMANN WRIGHT & PUGH
Service To:
China, Hong Kong and Philippines.

AMERICAN-PACIFIC S. S. CO.
See, GENERAL STEAMSHIP CORP., Agents

AMERICAN PRESIDENT LINES, LTD.
See, COASTWISE LINE, Agents

AMERICAN REPUBLICS LINE
See, WILLIAMS, DIMOND & CO., Agents

AMERICAN-WEST AFRICAN LINE
See, COASTWISE LINE, Agents

ANGLO CANADIAN SHIPPING CO., LTD.
See, INTERNATIONAL SHIPPING CO., INC., Agents

ARROW LINE
See, SUDDEN & CHRISTENSON, INC., Agents

AUSTRALIAN DISPATCH LINE
See, J. J. MOORE & CO., Agents

BALFOUR, GUTHRIE & CO., LTD. AGENTS
Dexter Horton Building ELiot 1464
Lines:
DONALDSON LINE
KNUTSEN LINE (S. A. Service)

BERGER TRANSPORTATION CO.
66 Marion Street MAin 6340
Heinie Berger, President & Gen. Mgr.
Fred Bianco, Vice President
J. Lael Simmons, Secretary
H. A. Schurman, Seattle Agent
Service To:
Seattle to Cook Inlet Ports and Anchorage, Alaska.

BLACK DIAMOND S. S. CO.
See, WILLIAMS, DIMOND & CO., Agents

BLIDBERG-ROTHCHILD CO., INC.
See, INTERNATIONAL SHIPPING CO., INC., Agents

BLUE FUNNEL LINE
See, DODWELL & CO., Agents

BLUE STAR LINE AGENTS
1801 Northern Life Tower SEneca 1050
E. A. Gilbert, General Manager
S. C. Cramb, Marine Supt.
C. E. Greene, Gen. Freight Agent
C. W. Eshom, Traffic Manager
Agents For:
STAN LINE OF LONDON
Service To:
Orient, United Kingdom and Continent.

BORDER LINE TRANSPORTATION CO., THE
See, DODWELL, LTD., Agents

BULL, A. H. & CO.
See, WILLIAMS, DIMOND & CO., Agents

BURCHARD & FISKEN, INC. AGENTS
2103 Exchange Bldg. MAin 7419
H. W. Burchard, President
L. J. Kenevan, General Manager
S. W. Husseman, Oper. (Dist.) Mgr.
E. H. Gordon, Passenger Agent
Agents For:
CUNARD WHITE STAR LTD.
DONALDSON ATLANTIC LINE
EAST ASIATIC CO. INC.
FURNESS, WITHY & CO. LTD.
JAVA PACIFIC LINE
PRINCE LINE, LTD.
Service To:
United Kingdom and Continental Ports, China, Philippines, Straits Settlements, Dutch East Indies, India, Persian Gulf, South and East Africa.

BURNS STEAMSHIP CO.
See, OLYMPIC S. S. CO., Agents

CANADIAN AUSTRALASIAN LINE
See, CANADIAN PAC. S. S. CO., Agents

CANADIAN NATIONAL S. S. CO., LTD.
1329 Fourth Avenue MAin 4906
O. K. Daly, General Agent, Frt. Dept.
Malcolm J. Woods, Gen. Agt., Pass. Dept.
Service To:
Westview, B. C. (Powell River, B. C.), Ocean Falls, B. C., Prince Rupert, B. C., Ketchikan, Alaska.

CANADIAN PACIFIC S. S. CO.
1320-4th Avenue MAin 6275
A. J. Mahon, Gen. Agt., Passenger Dept.
E. M. Phelps, District Freight Agent
562 Stewart Building
Agents For:
CANADIAN AUSTRALASIAN LINE

CARPENTER LINE
See, INTEROCEAN S. S. CORP., Agents

COASTWISE LINE AND
COASTWISE (PACIFIC FAR EAST) LINE
Pier 24 AGENTS
ELiot 1924
C. L. Dodd, Oper. (Dist.) Mgr.
Miss M. L. Clement, Purchasing Agent
J. A. Ederer, Port Engineer
R. M. Costigan, Freight Agent
Miss L. P. Christensen, Pass. Agent
Agents For:
UNITED STATES LINES CO.
AMERICAN WEST AFRICAN LINE
PACIFIC TANKERS INC.
AMERICAN PRESIDENT LINES
PACIFIC FAR EAST LINE, INC.
Service To:
Coastwise (Freight), Far East (Freight), Intercoastal, including Havana (Freight), North Atlantic (Freight & Passenger).

COASTWISE STEAMSHIP & BARGE CO., INC.
See, JAMES GRIFFITHS & SONS, INC., Agents

COASTWISE STEAMSHIP & BARGE CO., LTD.
See, JAMES GRIFFITHS & SONS, INC., Agents

CUNARD WHITE STAR LTD.
See, BURCHARD & FISKEN, INC., Agents

DECHMANN WRIGHT & PUGH
See, AMERICAN MAIL LINE LTD., Agents

DECONHIL SHIPPING COMPANY
See, J. T. STEEB & CO., INC., Agents

DODWELL & CO. LTD. AGENTS
427 Colman Building ELiot 0145
R. A. Tinling, General Manager
G. H. Baldwin, Ass't Manager
Agents For:
DODWELL-HERLOFSON LINE
THE BLUE FUNNEL LINE
THE BORDER LINE TRANSPORTATION CO.
Service To:
Orient.

DODWELL-HERLOFSON LINE
See, DODWELL & CO. LTD., Agents

DONALDSON ATLANTIC LINE
See, BURCHARD & FISKEN, INC., Agents

DONALDSON LINE
See, BALFOUR, GUTHRIE & CO., Agents

EAST ASIATIC CO. INC.
See, BURCHARD & FISKEN, INC., Agents

EASTERN S. S. LINES
See, WILLIAMS, DIMOND & CO., Agents

FRUIT EXPRESS LINE
See, INTERNATIONAL PACIFIC COAST CORP., Agents

FRENCH LINE
See, GENERAL S. S. CORP., LTD., Agents

FURNESS, WITHY & CO., LTD.
See, BURCHARD & FISKEN, INC., Agents

GENERAL PETROLEUM CORP. OF CALIF.
(a Socony Vacuum Company)
Dexter-Horton Building
Service: Coastwise, Worldwide

GENERAL STEAMSHIP CORPORATION, LTD. AGENTS
553 Stuart Building MAin 4701
D. M. Dysart, Vice Pres. and Northwest Mgr.
R. K. Brown, Jr., Local Manager
E. M. Gall, Operating Manager
D. H. McChesney and
James Q. Paull, Traffic Department
Agents for:
AMERICAN-PACIFIC S. S. CO.
TRANSATLANTIC S. S. CO. LTD.
WESTFAL-LARSEN COMPANY LINE
INDEPENDENCE LINE
PACIFIC ORIENT EXPRESS LINE
KERR S. S. CO. INC.
FRENCH LINE
PACIFIC MEDITERRANEAN LINE
PACIFIC ISLAND TRANSPORT LINE
Service To:
Australia, East Coast S. America, Central America, North China, Orient, Philippine Islands, Dutch E. Indies, India, Straits Settlements, Persian Gulf, South Africa, Europe, Italy, Greece, South Seas.

GIRDWOOD SHIPPING CO. AGENTS
Northern Life Tower ELiot 1972
Line:
LAURITZEN LINE
Service To:
Casablanca, Marseille, Tunis, Alexandria, Haifa.

GRACE, W. R. & CO. AGENTS
408 White Building SEneca 4300
W. D. Vanderbilt, General Manager
O. Benson, Oper. (Dist.) Mgr.
T. O. Todd, Purchasing Agent
George Roberts, Port Captain
W. C. Angus, Port Engineer
P. DeMaio, Port Steward
D. W. Lawrence, Freight Agent
Helen Mjelva, Passenger Agent
Agents For:
GRACE LINE, INC.
JOHNSON LINE
Service to South America and Sweden.

GRIFFITHS, JAMES & SONS, INC.
914 Second Avenue MAin 3340
James F. Griffiths, Exec. Vice Pres.
F. J. McDowell, Vice Pres. & Gen. Mgr.
J. D. McMasters, Secretary
J. L. Sweetin, Marine Superintendent
E. L. Mottley, Asst. Secty.
J. E. Copeland, Mgr., Claims and Insurance
H. R. Davis, Executive Assistant
L. Wuthenow, Purchasing Agent
J. W. Tellgren, Port Steward
Agents For:
COASTWISE STEAMSHIP & BARGE CO., INC.
GRIFFITHS STEAMSHIP CO.
COASTWISE STEAMSHIP & BARGE CO., LTD.
Service To:
Pacific Coastwise and Offshore Ports

GRIFFITHS STEAMSHIP COMPANY
See JAMES GRIFFITHS & SONS, INC., Agents

HAMMOND SHIPPING CO., LTD.
See, AMERICAN MAIL LINE, LTD., Agents

HILLCONE STEAMSHIP CO.
See J. T. STEEB & CO., INC., Agents

HOLLAND-AMERICA LINE
See, ROYAL MAIL LINES, LTD., Agents

INDEPENDENCE LINE
See, GENERAL S. S. CORP., LTD., Agents

INTERNATIONAL FREIGHTING CORP.
See, POPE & TALBOT LINES, Agents

INTERNATIONAL PACIFIC COAST CORP.
Skinner Building AGENTS
SEneca 2992
Lines:
FRUIT EXPRESS LINE

INTERNATIONAL SHIPPING CO. INC.
714 Arctic Building AGENTS
SEneca 1676
A. W. Kinney, President & Gen. Mgr.
D. R. Girdwood, Vice President
F. B. Hancock, Secretary & Purch Agent
F. I. Nystrom, Oper. (Dist.) Mgr.
R. J. Lamont, Freight Agent
Agents For:
FRED OLSEN LINE
ANGLO CANADIAN SHIPPING CO.
PACIFIC ATLANTIC S. S. CO.
NORTH PACIFIC SHIPPING CO.
J. H. WINCHESTER & CO.
BLIDBERG-ROTHCHILD CO.

INTEROCEAN S. S. CORP. AGENTS
Dexter Horton Building ELiot 7014
C. Damon, Manager
Lines:
U.S.A. WAR SHIPPING ADMINISTRATION
INTEROCEAN LINE
KNUTSEN LINE
WEYERHAEUSER LINE
PACIFIC COAST DIRECT LINE
CARPENTER LINE
AGWILINES, INC.

ISTHMIAN S. S. CO.
White Bldg.
W. J. Schreter, Mgr.
M. M. Corbit, Traf. Mgr.
Service To:
Intercoastal, Philippines, China, Netherlands East Indies, French Indo-China, Straits Settlements (Malaya), Hawaiian Islands, India, Celon, Burma, Persian Gulf, Egypt, Palestine, Syria, Red Sea

JAVA PACIFIC LINE
See BURCHARD & FISKEN, Agents

JOHNSON LINE
See W. R. GRACE & CO., Agents

KERR S. S. CO. INC.
See, GENERAL S. S. CORP., LTD., Agents

KEYSTONE SHIPPING COMPANY
See J. T. STEEB & COMPANY, INC., Agents

KLAVENESS LINE
See SUDDEN & CHRISTENSON, INC., Agents

KNUTSEN LINE (S. A. Service)
See BALFOUR, GUTHRIE & CO., Agents and INTEROCEAN S. S. CORP., Agents

LATIN-AMERICAN LINE
See, J. J. MOORE & CO., Agents

LAURITZEN LINE
See GIRDWOOD SHIPPING CO., Agents

LUCKENBACH GULF S. S. CO., INC.
2902 Smith Tower ELiot 1208

LUCKENBACH S. S. CO., INC.
H. E. Rhoda, Dist. Mgr.
R. C. Elander, Ass't Dist. Mgr.
E. S. Ramey, Mgr. Eng. Dept.
A. J. Morrill, Dist. Marine Supt.
W. Guthrie, Wharfinger
E. Basel, Cashier
Service To: (Luckenbach Gulf)
Houston, New Orleans, Mobile, Tampa
Service To: (Luckenbach S. S.)
Boston, Camden, Philadelphia, Brooklyn

LYKES BROS. S. S. CO., INC.
See, AMERICAN MAIL LINE, LTD., Agents

MARINE TRANSPORT LINES
See, WILLIAMS, DIMOND & CO., Agents

MATSON NAVIGATION CO.
See, ALEXANDER & BALDWIN, LTD., Agents

MOORE, J. J. & CO., INC. AGENTS
914 Second Ave. ELiot 0930
Agents For:
LATIN-AMERICAN LINE
SOUTH AFRICAN DISPATCH LINE
AUSTRALIAN DISPATCH LINE
ALASKA PACKERS ASSOCIATION
Service To:
West Coast of South American, South Africa, Australia.

MOORE-McCORMACK LINES, INC.
Dexter Horton Building ELiot 2732
C. J. Gravesen, Manager
D. C. Buckingham, Oper. Mgr.
W. P. Lyman, Traffic Manager
C. F. Ramey, Purchasing Agent
F. W. Bury, Freight Agent
M. L. Murie, Passenger Agent
Agents For:
PACIFIC REPUBLICS LINE
ALL SOVIET FLAG VESSELS
Service To:
East Coast of South America and Caribbean Seaports.

MORAN TOWING & TRANSPORTATION CO.
See, WILLIAMS, DIMOND & CO., Agents

NORTHLAND TRANSPORTATION CO.
Pier 56 MAin 4600

NORTH PACIFIC SHIPPING CO., LTD.
See INTERNATIONAL SHIPPING CO., INC., Agents

NORTON LILLY & CO.
Smith Tower ELiot 6840

FRED OLSEN LINE
See INTERNATIONAL SHIPPING CO., INC., Agents

OLYMPIC STEAMSHIP CO., INC.
Pier 57 MAin 4520
E. C. Bentzen, President
M. M. Stewart, Executive Assistant
G. R. Seefeldt, Operating Manager
G. S. Cleverdon, Comptroller & Asst. Treas.
Capt. C. E. Gannon, Marine Supt.
Merle A. Johnston, Port Engineer
A. R. Palmer, Port Steward
I. Henningsen, Mgr., Claims & Insurance
F. J. Ewers, Asst. Freight Traf. Manager
Agents For:
BURNS S. S. CO.
SHEPARD S. S. CO.

PACIFIC-ATLANTIC S. S. CO.
See INTERNATIONAL SHIPPING CO., INC. Agents

PACIFIC COAST DIRECT LINE
See INTEROCEAN S. S. CORP., Agents

PACIFIC FAR EAST LINE, INC.
See, COASTWISE LINE, Agents

PACIFIC ISLAND TRANSPORT LINE
See GENERAL S. S. CORP., LTD., Agents

PACIFIC MEDITERRANEAN LINE
See, GENERAL S. S. CORP., Agents

PACIFIC ORIENT EXPRESS LINE
See, GENERAL S. S. CORP., Agents

PACIFIC REPUBLICS LINE
See, MOORE-McCORMACK LINES, Agents

PACIFIC TANKERS INC.
See, COASTWISE LINE, Agents

PARRY NAVIGATION CO.
653 Dexter Horton Bldg. Eliot 7332
Kenneth W. Gilmore, Dist. Mgr.
Leo J. Cummings, Asst. Dist. Mgr.

POPE & TALBOT LINES AGENTS
Pier 48 ELiot 4630
E. J. Barrington, General Manager
Capt. J. C. Lass, Oper. (Dist.) Mgr.
E. G. Harrison, Purchasing Agent
J. C. Harper, Freight Agent
Agents For:
ALCOA STEAMSHIP CO.
INTERNATIONAL FREIGHTING CORP.
SMITH & JOHNSON
WESSEL DUVAL CO.
PRUDENTIAL S. S. CORP.
SPRAGUE S. S. CO.
STOCKARD S. S. CO.
Service To:
California Ports, Atlantic Coast Ports, Puerto Rico.

PRINCE LINE
See BURCHARD & FISKEN, Agents

PRUDENTIAL S. S. CORP.
See, POPE & TALBOT LINES, Agents

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Canadian National Dock ELiot 1600
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Edith R. Lovejoy, Secretary-Treasurer

RICHFIELD OIL CORPORATION MAin 3010
Division Office, 217 Pine Street ELiot 3071
Marine Terminal, Harbor Island, West Waterway
Seattle, Washington

ROYAL MAIL LINES, LTD.
1731 Exchange Building ELiot 4944
C. W. Varney, Pacific Coast Manager
K. K. Barker, Traffic Manager
S. H. Jarvis, Purchasing Agent
J. Donnell, Freight Agent
Service To:
North Pacific Coast Ports to United Kingdom and Holland
Agents For:
HOLLAND-AMERICA LINE

SANTA ANA STEAMSHIP CO.
Colman Building MAin 0583

SEAS SHIPPING CO.
See, WILLIAMS, DIMOND & CO., Agents

SMITH & JOHNSON
See, POPE & TALBOT LINES, Agents

SOUTH AFRICAN DISPATCH LINE
See, J. J. MOORE & CO., Agents

SOUTH ATLANTIC S. S. CO.
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SPRAGUE S. S. CO.
See POPE & TALBOT LINES, Agents

STAN LINE OF LONDON
See BLUE STAR LINE, Agents

STANDARD OIL CO.
Richmond Beach, Wash.
L. Simonson, Marine Supt.

STEEB, J. T., & CO., INC. AGENTS
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DECONHIL SHIPPING CO.
HILLCONE STEAMSHIP CO.
KEYSTONE SHIPPING COMPANY
W. H. WICKERSHAM & CO.

STOCKARD S. S. CO.
See, POPE & TALBOT LINES, Agents

SUDDEN & CHRISTENSON, INC.
Arctic Building AGENTS
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H. B. Blair, Operating Mgr.
R. W. Love, Office Mgr.
Lines:
ARROW LINE
KLAVENESS LINE

SWEDISH AMERICAN LINE
White Building MAin 5640

TEXAS COMPANY, THE
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TIDEWATER ASSOCIATED OIL CO.
1733 So. Alaskan Way
J. D. Cardoza, Dist. Sales Mgr.
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TRANSATLANTIC S. S. CO., LTD.
See, GENERAL S. S. CORP., LTD., Agents

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2901 Western

UNITED FRUIT COMPANY
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J. C. Hickey, Manager

UNITED STATES LINES CO.
See, COASTWISE LINE, Agents

U.S.S.R. VESSELS
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WESTFAL-LARSEN CO. LINE
See, GENERAL S. S. CORP., Agents

WEYERHAEUSER LINE
Agents:
INTEROCEAN S. S. CORP.
Dexter Horton Bldg. ELiot 7014

WICKERSHAM & CO., W. H.
Agents:
J. T. STEEB & CO., INC.
410 Insurance Bldg. ELiot 1891

WILLIAMS, DIMOND & CO.
Vance Building ELiot 8120
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A. H. BULL & CO.
MORAN TOWING & TRANSPORTATION CO.
SOUTH ATLANTIC S. S. CO.
EASTERN S. S. LINES
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BLACK DIAMOND S. S. CO.
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Service To:
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WILMORE S. S. CO.
See, WILLIAMS, DIMOND & CO., Agents

WINCHESTER, J. H. & CO.
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CALIFORNIA-EASTERN LINE, INC.
1010 Washington ATwater 1361

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1010 Washington St. ATwater 1361
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Kenneth Robertson, Secretary
A. J. Chalmers, Oper. (Dist.) Mgr.
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R. K. McClelland, Purchasing Agent
H. C. Dyer, Port Captain
L. A. Vallet, Port Engineer
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R. K. McClelland, Purchasing Agent
H. C. Dyer, Port Captain
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See: PACIFIC-ATLANTIC S.S. CO., Agents
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INTEROCEAN LINE
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PACIFIC ORIENT EXPRESS LINE
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See, BALFOUR, GUTHRIE & CO. (CANADA), Agents

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See: CANADA SHIPPING CO., LTD., Agents

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Pacific National Fire Insurance Co.
Canton Insurance Office, Limited
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564 Stuart Building
Los Angeles 13
541 South Spring Street

ATLANTIC MUTUAL INSURANCE COMPANY

CENTENNIAL INSURANCE COMPANY
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Balfour Building
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Camden Fire Insurance Association
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Stuart Building
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900 Board of Trade Building
Los Angeles 13, California
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Southern California Marine Department
548 South Spring Street

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San Francisco, California
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441 California Street SUtter 7680
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L. L. George, Special Agent
1021 Central Bank Building
14th & Broadway GLencourt 5076
Los Angeles 13, California
Roy O. Elmore, Supt. Marine Dept.
548 South Spring Street MAdison 1471
Portland 4, Oregon
John M. Benedict, Special Agent
1120 Spalding Building
319 S. W. Washington Street ATwater 8653
Seattle 4, Washington
Forest Guptill, Special Agent
711 Dexter Horton Building ELliott 4025

HINCHMAN-ROLPH & LANDIS
In Association with
CHAPMAN & CO.
Insurance Underwriters
(Marine-Fire-Automobile-Casualty)
San Francisco, California
345 Sansome Street **DOuglas 8080**
Partners:
James Ralph III
Philip F. Landis
F. J. Pelletier
George M. Parrish
G. A. O'Sullivan
Joe Ghirardelli, Associate General Agent
A. W. Lidgate, Asst. Marine Underwriter
Representing:
American Eagle Fire Insurance Company
American Equitable Assurance Company
The Continental Insurance Company of New York
The Commonwealth Insurance Company of New York
Branch Offices:
Seattle, Washington
G. A. O'Sullivan, Manager
1411 - 4th Avenue Building
Los Angeles, California
James W. Scanlon, Manager
548 South Spring Street
Portland, Oregon
Fred Brennan, Manager
American Bank Building

HOME INSURANCE COMPANY OF NEW YORK

San Francisco, California
341 Montgomery Street EXbrook 5600
Clayton E. Roberts, Marine Manager
A. Martinez, Jr., Marine Manager
Representing:
Franklin Fire Insurance Company of Philadelphia
Branch Offices:
Los Angeles 14, California
639 South Spring Street
Seattle 4, Washington
J. C. Selz, Jr., Marine Manager
814 Dexter Horton Building
Portland 4, Oregon
Thomas W. Shepard, Marine Supervisor
520 Lumbermen's Building
Denver 2, Colorado
406 Tramway Building

A. B. KNOWLES & CO., INC.

Marine Insurance Underwriters
San Francisco 4, California
114 Sansome Street SUtter 5268
A. B. Knowles, President
C. H. Preston, Vice President
Frank I. Ford, Treasurer
Joseph C. Miller, Secretary
Donald B. Porter, Assistant Secretary
Peyton Y. Alverson, Supt. of Agencies
Representing:
Utah Home Fire Insurance Company
Millers National Insurance Company
Branches:
Los Angeles, California
F. N. Farrell, Manager
412 West Sixth Street
Seattle, Washington
264 Colman Building

MARINE OFFICE OF AMERICA

Pacific Department
San Francisco 4, California
340 Pine Street GArfield 7939
F. B. Galbreath, Manager
E. E. Cummings, Assistant Manager
Representing:
American Insurance Company
Glens Falls Insurance Company
Firemen's Insurance Company
Hanover Fire Insurance Company
Continental Insurance Company
American Eagle Fire Insurance Company
Fidelity-Phenix Fire Insurance Company
Niagara Fire Insurance Company
Branch Offices:
Los Angeles, California
Neil Dunning, Manager
F. L. Walter, Manager
Stockton, California
George Dienst, Manager
Seattle, Washington
P. A. Carew, Manager

MATHEWS & LIVINGSTON

Marine Underwriters
San Francisco, California
200 Bush Street SUtter 2970
Sidney A. Livingston
F. A. Jansen, Ocean Marine
R. H. Law, Inland Marine
A. Seabury, Claims
A. J. Marshall, Accounting
Representing:
Aetna Insurance Co.
Queen Insurance Co.
Maritime Insurance Co., Ltd.
Fidelity-Phenix Fire Insurance Co.
Branch Offices:
Los Angeles, California
R. Thornton, Manager
111 West 7th Street
Seattle, Washington
W. J. Shackelford, Manager
Colman Building

WM. H. McGEE CO.

San Francisco, California
300 California Street EXbrook 7304
Chas. Brockmiller, Vice President
Chas. LaBare, Assistant Secretary
Representing:
Sun Insurance Office, Ltd. of London
Northern Assurance Co., Ltd.
Sun Underwriters Ins. Co. of New York
Patriotic Insurance Co. of America
Reliable Fire Insurance Co. of Dayton
Royal Exchange Assurance
Indemnity Marine Assurance Co., Ltd.
Security Insurance Co. of New Haven
East and West Insurance Co.
Phoenix Insurance Co. of Hartford
Equitable Fire & Marine Insurance Co.
Camden Fire Insurance Association
Branch Offices:
Los Angeles, California
Claude B. Moss, Manager
548 South Spring Street

H. M. NEWHALL & COMPANY

San Francisco, California
260 California Street SUtter 3161
Edgar H. Lion, Vice President
H. M. Coffey, Assistant Secretary
Representing:
The Ocean Marine Insurance Co., Ltd. of London
The London Assurance
Alliance Assurance Co., Ltd. of London
Detroit Fire and Marine Insurance Company
American Alliance Insurance Company

NORTH AMERICA COMPANIES

Pacific Coast Department
San Francisco 4, California
222 Sansome Street EXbrook 5900
F. F. Owen, General Manager
T. K. Hannum, Manager Marine Dept.
W. V. Hall, Manager, Ocean Marine
L. E. Brame, Inland Marine
V. A. Newman, Jr., Loss Superintendent
Representing:
Insurance Company of North America
Alliance Insurance Company
Philadelphia Fire & Marine Insurance Company
Branch Offices:
Los Angeles 14, California
A. L. Sullivan, Manager
Wm. C. Stephan, Loss Department
621 South Spring Street
Seattle 4, Washington
P. E. Jacoby, Manager
Seattle Service Office
(Services Washington, Oregon, Montana, Idaho Panhandle)
508 Colman Building

PACIFIC MARINE INSURANCE AGENCY, INC.

San Francisco 4, California
E. C. Evans Agencies, Managers
520 California Street SUtter 4114
E. C. Evans, Jr.
H. L. Evans

PACIFIC MARINE INSURANCE AGENCY, INC.

W. J. Jansen
Representing:
Westchester Fire Insurance Company
United States Fire Insurance Company
Agricultural Insurance Company
The North River Insurance Company
Western Assurance Company
Seaboard Fire & Marine Insurance Company
The Century Insurance Company, Limited
The Pacific Coast Fire Insurance Company
Empire State Insurance Company
The British America Assurance Company
Representing Underwriters at Lloyd's, London
Branch Offices:
Los Angeles, California
R. S. Swanson, Manager
530 West Sixth Street

PARROTT & COMPANY

San Francisco, California
231 Sansome Street DOuglas 2400
Carl A. Jones, Manager
Representing:
North British & Mercantile Insurance Co,. Ltd.
Northwestern National Insurance Company
Agents:
San Diego, California
Stewart C. Kendall
343 Spreckels Building
Portland, Oregon
Walter J. Pearson
442 Pittock Block Building
Seattle, Washington
Swett & Crawford
1065 Stuart Building
Vancouver, B. C.
Bell-Irving Insurance Agencies, Ltd.
989 West Hastings Street

RATHBONE, KING & SEELEY

General Agents
San Francisco 4, California
114 Sansome Street GArfield 3900
Partners:
E. T. King
Charles Seeley
D. A. Ayling, Ocean Marine Underwriting
E. G. Taggart, Claims
Representing:
Chubb & Son
Federal Insurance Company
The Sea Insurance Company, Ltd.
The Marine Insurance Company, Ltd.
The Century Insurance Company, Ltd.
Branch Offices:
Los Angeles, California
L. C. Carleton, Manager
F. M. Hurd, Underwriter
650 South Spring Street VAndike 5107
Portland, Oregon
M. B. Waterbury, Manager
310 S. W. Fourth Street BEacon 7297

RHODE ISLAND INSURANCE COMPANY

San Francisco 4, California
155 Sansome Street EXbrook 6193
George N. Arnold, Manager Marine Dept.

LOUIS ROSENTHAL AGENCY
Marine Insurance
San Francisco 4, California
231 Sansome Street EXrook 1076
Charles E. Pinkham, Manager
Gerald Schoenfeld, Assistant Manager
Representing:
Switzerland General Insurance Company, Ltd.
Thames & Mersey Marine Insurance Company, Ltd.
The Liverpool & London & Globe Insurance Co., Ltd. (Marine Dept.)
Hartford Fire Insurance Company (Marine Dept.)

ROYAL INSURANCE COMPANY, LTD.
San Francisco, California
201 Sansome Street DOuglas 5855
G. H. Bunyan, Manager Marine Dept.
Representing:
Newark Fire Insurance Co.

ST. PAUL FIRE AND MARINE INSURANCE COMPANY
Pacific Department
San Francisco 4, California
Mills Building SUtter 4022
E. B. Barry, Marine Secretary
H. E. Castle, Marine Dept. Manager

THE STANDARD FIRE INSURANCE COMPANY
See: THE AUTOMOBILE INSURANCE COMPANY OF HARTFORD, CONN.

STANDARD INSURANCE COMPANY OF NEW YORK
See: CALIFORNIA AGENCIES

STANDARD MARINE INSURANCE CO., LTD.
Swett & Crawford
Pacific Coast General Agents
San Francisco, California
100 Sansome Street SUtter 4400
R. J. Lutich, Manager Pacific Coast Marine Dept.
Branch Offices:
Los Angeles, California
621 So. Hope Street
Portland, Oregon
1515 Yeon Building
Seattle, Washington
1065 Stuart Building

TALBOT, BIRD & COMPANY
San Francisco, California
114 Sansome Street DOuglas 5107
Harry W. Browne, Vice President
Louis M. Howe, Underwriter
Jack T. Hayes, Claims Department
Representing:
Eagle Star Insurance Co., Ltd. (United States Managers)
Universal Insurance Co. (General Managers)
Globe & Rutgers Fire Insurance Co. (Marine General Agents)
Branch Offices:
Los Angeles, California
R. A. Kanzee, Manager
111 West Seventh Street
Seattle, Washington
Morsman Condit, Manager
Douglas Building

M. THOMPSON & CO. INC.
Ocean Marine General Agents
San Francisco, California
311 California Street SUtter 3641
Mitchell Thompson, President
Ralph M. Thompson, Vice President
Walter P. Thompson, Vice President
John Hozack, Marine Department
James F. Fayen, Asst. Manager Marine Department
Representing:
Boston Insurance Company
Old Coloony Insurance Company
The Connecticut Fire Insurance Company
Great American Insurance Company
Branch Offices:
Los Angeles 13, California
Quentin M. Thompson, Resident Manager
541 South Spring Street

UNION INSURANCE SOCIETY OF CANTON, LTD.
San Francisco, California
Pacific Coast Control Branch
340 Pine Street EXbrook 3154
T. B. Dean, Manager
Branch Offices:
Seattle, Washington
F. W. Perry, Manager
Colman Building MAin 5723
Vancouver, B. C.
W. R. Brydon, Manager
Yorkshire Building MArine 3331

UNION MARINE & GENERAL INSURANCE CO., LTD.
San Francisco, California
114 Sansome Street DOuglas 6313
Geo. H. Ismon, Underwriter
Representing:
Phoenix Assurance Company, Ltd. of London
Norwich Union Fire Ins. Society, Ltd.
Columbia Insurance Co.

WORLD FIRE & MARINE INSURANCE COMPANY
See: CALIFORNIA AGENCIES

MARINE INSURANCE COMPANIES	AGENTS
Aetna Insurance Co.	Mathews & Livingston
Agricultural Insurance Company	Pacific Marine Insurance Agency, Inc.
	Edward Brown & Sons
Alliance Assurance Co., Ltd., of London	H. M. Newhall & Company
Alliance Insurance Company	North America Companies
American Alliance Insurance Company	H. M. Newhall & Company
American Eagle Fire Insurance Company	Hinchman-Rolph & Landis in Association with Chapman & Co.
	Marine Office of America
American Equitable Assurance Company	Hinchman-Ralph & Landis in Association with Chapman & Co.
American Insurance Company	Marine Office of America
American & Foreign Insurance Co.	Balfour, Guthrie & Co., Limited
Anchor Insurance Co.	W. B. Brandt & Co., Inc.
Atlas Assurance Co., Ltd.	W. B. Brandt & Co., Inc.
Boston Insurance Company	M. Thompson & Co., Inc.
British-America Assurance Company, The	Pacific Marine Insurance Agency, Inc.
British & Foreign Marine Insurance Co., Ltd., The	Balfour, Guthrie & Co., Limited
Camden Fire Insurance Association	Cravens, Dargan & Company
	Wm. H. McGee Co.
Canton Insurance Office, Limited	American International Marine Agency
Century Insurance Company, Ltd., The	Pacific Marine Insurance Agency, Inc.
	Rathbone, King & Seeley
Chubb & Son	Rathbone, King & Seeley
Columbia Insurance Co.	Union Marine & General Insurance Co., Ltd.
Connecticut Fire Insurance Company, The	M. Thompson & Co., Inc.
Commonwealth Insurance Company of New York	Hinchman-Rolph & Landis in Association with Chapman & Co.
Continental Insurance Company	Marine Office of America
Continental Insurance Company of New York, The	Hinchman-Rolph & Landis in Association with Chapman & Co.
Detroit Fire and Marine Insurance Company	H. M. Newhall & Company
Eagle Star Insurance Co., Ltd.	Talbot, Bird & Company (U. S. Managers)
East and West Insurance Co.	Wm. H. McGee Co.
Equitable Fire & Marine Insurance Co.	Wm. H. McGee Co.
Empire State Insurance Company	Pacific Marine Insurance Agency Inc.
Federal Insurance Company	Rathbone, King & Seeley

MARINE INSURANCE COMPANIES	AGENTS (Continued)
Fidelity-Phenix Fire Insurance Company	Marine Office of America
	Mathews & Livingston
Firemen's Insurance Company	Marine Office of America
Franklin Fire Insurance Company of Philadelphia	Home Insurance Company of New York
Fulton Fire Insurance Company	Cravens, Dargan & Company
General Insurance Co. of America	Talbot, Bird & Company (Marine Managers)
Glens Falls Insurance Company	Marine Office of America
Globe & Rutgers Fire Insurance Co.	Talbot, Bird & Company (Marine General Agents)
Great American Insurance Company	M. Thompson & Co., Inc.
Hanover Fire Insurance Company	Marine Office of America
Hartford Fire Insurance Company (Marine Dept.)	Louis Rosenthal Agency
Home Fire & Marine Insurance Company	Balfour, Guthrie & Co., Limited
Home Fire & Marine Insurance Co. of California	Fireman's Fund Insurance Company
Indemnity Marine Assurance Co., Ltd.	Wm. H. McGee Co.
Insurance Company of North America	North America Companies
Liverpool & London & Globe Insurance Co., Ltd. (Marine Dept.)	Louis Rosenthal Agency
Lloyd's of London	Cravens, Dargan & Company
	Pacific Marine Insurance Agency, Inc. (Representing Underwriters)
London Assurance, The	H. M. Newhall & Company
London and Lancashire Ins. Co., Ltd.	Cravens, Dargan & Company
Lumbermen's Insurance Company	Fire Association of Philadelphia
Marine Insurance Company, Ltd., The	Rathbone, King & Seeley
Maritime Insurance Co., Ltd.	Mathews and Livingston
Millers National Insurance Company	A. B. Knowles & Co., Inc.
National Union Fire Insurance Co.	American International Marine Agency
Newark Fire Insurance Co.	Royal Insurance Company, Ltd.
New Hampshire Fire Insurance Co.	American International Marine Agency
Niagara Fire Insurance Company	Marine Office of America
North British & Mercantile Insurance Co., Ltd.	Parrott & Company
North River Insurance Company, The	Pacific Marine Insurance Agency, Inc.
Northern Assurance Co., Ltd.	Wm. H. McGee Co.
Northwestern National Insurance Company	Parrott & Company
Norwich Union Fire Ins. Society, Ltd.	Union Marine & General Insurance Co., Ltd.
Ocean Marine Insurance Co., Ltd. of London, The	H. M. Newhall & Company
Old Colony Insurance Co.	W. B. Brandt & Co., Inc.
	M. Thompson & Co., Inc.
Pacific Coast Fire Insurance Company, The	Pacific Marine Insurance Agency, Inc.
Pacific National Fire Insurance Co.	American International Marine Agency
Patriotic Insurance Co. of America	Wm. H. McGee Co.
Pennsylvania Fire Insurance Co. (Marine Dept.)	Balfour, Guthrie & Co., Limited
Philadelphia Fire & Marine Insurance Company	North America Companies
Philadelphia National Insurance Company	Fire Association of Philadelphia
Phoenix Assurance Company, Ltd. of London	Union Marine & General Insurance Co., Ltd.
Phoenix Insurance Co. of Hartford	Wm. H. McGee Co.
Providence Washington Insurance Co.	W. B. Brandt & Co., Inc.
Queen Insurance Co.	Mathews & Livingston
Reliable Fire Insurance Co. of Dayton	Wm. H. McGee Co.
Reliance Insurance Company	Fire Association of Philadelphia
Royal Exchange Assurance	Cravens, Dargan & Company
	Wm. H. McGee Co.
Sea Insurance Company, Ltd., The	Rathbone, King & Seeley
Seaboard Fire & Marine Insurance Company	Pacific Marine Insurance Agency, Inc.
Security Insurance Co. of New Haven	Wm. H. McGee Co.
Sun Insurance Office, Ltd. of London	Wm. H. McGee Co.
Sun Underwriters Ins. Co. of New York	Wm. H. McGee Co.
Switzerland General Insurance Company, Ltd.	Louis Rosenthal Agency
Thames & Mersey Marine Insurance Company, Ltd.	Louis Rosenthal Agency
Union Insurance Society of Canton, Ltd.	Balfour, Guthrie & Co., Limited
United States Fire Insurance Company	Pacific Marine Insurance Agency, Inc.
Universal Insurance Co.	Talbot, Bird & Company (General Managers)
Utah Home Fire Insurance Company	A. B. Knowles & Co., Inc.
Westchester Fire Insurance Company	Pacific Marine Insurance Agency, Inc.
Western Assurance Company	Pacific Marine Insurance Agency, Inc.
Western National Insurance Company	Fireman's Fund Insurance Company

Next Entrance Examinations to King's Point

Entrance examinations for appointment in the next class of cadet-midshipmen of the U. S. Merchant Marine Cadet Corps and its Academy at Kings Point, New York, will be held on April 4, 1947, it was announced by Commander E. G. McDonald, USMS, District Supervisor, 1000 Geary Street, San Francisco, California.

Excellent opportunity to obtain, at no cost, a combined technical training and college education leading to a career as ship's officer at sea and, after sea experience, positions in the shipping industry and its allied activities are offered to qualified candidates. Cadet-midshipmen receive at least $65 monthly pay and quarters and subsistence besides a free college course.

High school seniors 16½ to 21 years of age scheduled to graduate in May or June, 1947, may apply. To enable them to complete high school and receive diplomas, successful candidates will not be assigned until July, 1947.

Academy graduates qualify for commissions as Ensign, U. S. Maritime Service, and Ensign, U. S. Naval Reserve as well as licenses as ship's officers in the deck or engine department.

Commander McDonald urges interested candidates to apply early as many applicants failed to qualify for the last entrance examination because applications arrived too late to be properly reviewed. Write or wire: Supervisor, U. S. Merchant Marine Cadet Corps, Training Organization, Washington 25, D. C.

Seamen's Training Courses

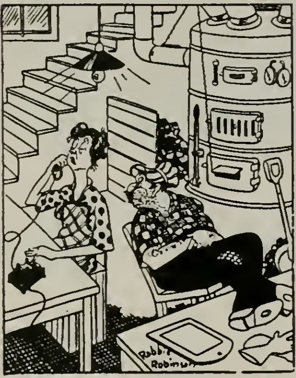
Captain Malcolm E. Crossman, USMS, Superintendent of the U. S. Maritime Service Training Station, Alameda, California, has completed plans for the first class of qualified seamen to begin annual training duty at the station on January 2, 1947. The course is to provide all unlicensed merchant marine personnel with the basic trade knowledge to become better qualified seamen, to promote safe and economical practices and to assist trainees to qualify for advancement.

The course of training for unlicensed seamen is four weeks during which trainees will receive pay and subsistence. Ten types of training will be offered in this new program for which there will be weekly quotas. Unlicensed merchant seamen already enrolled in the U. S. Maritime Service or eligible for enrollment may apply for the training provided they have served for eight months at sea aboard vessels of the U. S. Merchant Marine during the twelve months prior to enrollment.

Twelve types of training will also be offered to officers of the U. S. Merchant Marine in the refresher courses effective January 2, 1947, to be held at the U. S. Maritime Service Training Station, Sheepshead Bay, New York. This will be to provide licensed officers with a course of instruction designed to keep them abreast of the latest modern developments. Pay and subsistence will be available for trainees in all types of refresher courses.

Applicants should apply at the U. S. Maritime Service Enrolling Office, 1000 Geary Street, San Francisco, California.

MARINE ENGINEER ASHORE



"Piccadilly Apts., Combustion Engineer's Office, Mr. Murphy's secretary speakin'."
Cartoon courtesy of
American Hoist & Derrick Co.

Merchant Marine Training at Seattle

With the addition of an engineering course to the navigation and radio program, a complete merchant marine officer training course will be offered Puget Sound seamen by the Washington Technical institute at the YMCA, 909 4th Avenue, Seattle.

The engineer's school will be conducted by Perry E. Foy, who was an instructor at the former U. S. Maritime Upgrading School in Seattle. He will teach candidates trying for either original or raise in grade tickets.

Experienced officers of the Navy or Coast Guard are eligible for merchant marine training. Unlicensed personnel in the Navy, Coast Guard or Merchant Marine service, with 18 months experience on deck or engine room, may take advantage of this new service.

The navigation school for masters and deck officers is headed by Captain Harold Kildall and Captain Joseph M. Kildall, who, for the past 21 years, have graduated thousands of licensed personnel.

Graduates of this school have made an excellent showing in the Merchant Marine, Navy and Coast Guard during the war. Seven of them received Distinguished Service medals in the line of duty.

The radio school which offers training in servicing and operating, handles Merchant Marine candidates and commercial operators. Heading this section is A. Lehnhoff.

More information on these schools may be had by writing or calling Wayne Gardner at the Central YMCA, 909 4th Avenue, Seattle, Washington.

Ex-Enlisted Men May Be Commissioned for Naval Reserve Service

The Navy is offering commissions to qualified ex-enlisted men who wish to return to active duty in the Volunteer Naval Reserve. The program, which will remain open indefinitely, is established to qualify men who through lack of service or opportunity, were not eligible for advancement to commissioned rank during the war. Those who are qualified for a commission and who wish to take an active part in the peacetime reserve, may now apply.

To qualify, the applicant must have served honorably in the Navy, Naval Reserve, Coast Guard or Coast Guard Reserve in World War II. Age limits are 19 to 30 years. Qualifications and information may be obtained from the Office of Naval Officer Procurement, Ferry Building, San Francisco.

Shoreside Personalities

WILFRED A. (Bill) SECHRIST, who has been in sales promotion work with some of the country's leading industries, has been appointed Director of Marketing for Ellinwood Industries, Los Angeles. He will handle marketing activities for their farm equipment, marine and aircraft, and office equipment divisions, in addition to continuing as sales manager of their electronics division.

Wilfred A. Sechrist of Ellinwood Industries, Inc.

* * *

FAGEOL PRODUCTS COMPANY OF KENT, OHIO, engine manufacturers, have recently entered the marine field, marketing two Fageol marine engines, designated FM200 and FM225, to be introduced at the January Motor Boating Show in New York.

L. G. Fageol, who is president of Twin Coach Company and is nationally recognized as an authority on engine design, is also widely known for his trophy-winning boating activities. It is expected that the Fageol marine engines will arouse much interest among boat manufacturers and owners.

* * *

HEADS RESEARCH OF AMERICAN PIER FACILITIES: To make exhaustive studies of American pier and harbor facilities and to submit recommendations for their improvements, *William Miley*, president of the Independent Pier Company, is head of the recently-created Economics and Statistical Division of the U. S. Maritime Commission.

* * *

CAPTAIN FRIED HAS RETIRED FROM THE SEA: After 48 years service in the Navy, Merchant Marine and other government services, *Captain George Fried*, one of the nation's outstanding shipmasters, has retired. He is known to have coined the famous phrase while master of the SS American Legion going to the rescue of an Italian ship in a North Atlantic gale, "*We will not abandon you*," and which phrase was the subject for a marine painting.

In recent years, Captain Fried has been Marine Inspection Officer for the U. S. Coast Guard. He has been decorated 13 times by half a dozen nations for seamanship and exploits at sea.

Pell W. Foster, Jr., vice president and director of Foster Wheeler Corp.

PELL W. FOSTER, JR., vice president and director of the Foster Wheeler Corporation, has been appointed vice president in charge of production. He has been associated with the company for 27 years, was elected a vice president in 1942 and a member of the board of directors in 1938.

United Seamen's Service To Continue as Permanent Seamen's Welfare Agency

The continuation of the United Seamen's Service, wartime agency, as a permanent postwar welfare agency for American merchant seamen has been approved by its executive committee which consists of leading representatives of the shipping industry, maritime unions and the public, it is announced by Otho J. Hicks, executive director.

The president is William S. Newell, who is also president of the Bath Iron Works, Bath, Me., and of the Society of Naval Architects and Marine Engineers.

The U.S.S. was organized by Admiral Land in September, 1942, to provide emergency war services for merchant seamen on American flag ships, who had no Red Cross or USO to turn to at a time when Nazi submarines were taking a heavy toll of American shipping and lives.

REPAIRS by BETHLEHEM

Twin-machining operations are typical of Bethlehem methods for expediting ship repairs.

Success Story...

Rebuilding of the after-section of the 92-ton crankshaft of the Motorship Poelau Laut is a typical example of why so many shipping operators prefer Bethlehem for ll types of ship repairs.

Powered by one of the largest Diesel motors afloat, the 535-foot Poelau Laut developed crankshaft trouble while plying the Pacific. Knowing that Bethlehem was the only privately-operated organization on the West Coast with facilities to handle efficiently the big repair job that was necessary, her operators sent her to Bethlehem's San Pedro Yard.

The enormous 53-foot shaft was removed from the combination freight and passenger vessel with minimum disturbance to existing bulkheads through the ingenious use of skids. Examination disclosed that the forward half of the shaft would have to be replaced, but that the after half could be rebuilt.

The rebuilding job included replacement of five of the huge journal pins. The fact that the shaft was designed to have each crankpin and its web in one solid forging and the journal pins shrunk in the crankwebs presented no complications for Bethlehem's skilled craftsmen. When the job was completed, the after section was joined to a spare forward half and the entire crankshaft reassembled and replaced.

Today, the Poelau Laut is back in service again, with her 8,000 hp Diesel performing to the complete satisfaction of her owners—a success story that is the usual result of Repairs By Bethlehem.

SHIPBUILDING YARDS

QUINCY YARD
Quincy, Mass.
STATEN ISLAND YARD
Staten Island, N. Y.
BETHLEHEM-SPARROWS POINT SHIPYARD, INC.
Sparrows Point, Md.
SAN FRANCISCO YARD
San Francisco, Calif.
BETHLEHEM-ALAMEDA SHIPYARD, INC.
Alameda, Calif.
SAN PEDRO YARD
Terminal Island, San Pedro, Calif.

SHIP REPAIR YARDS

BOSTON HARBOR
Atlantic Yard
Simpson Yard
NEW YORK HARBOR
Brooklyn 27th Street Yard
Brooklyn 56th Street Yard
Hoboken Yard
Staten Island Yard
BALTIMORE HARBOR
Baltimore Yard
SAN FRANCISCO HARBOR
San Francisco Yard
Alameda Yard
SAN PEDRO HARBOR (Port of Los Angeles)
San Pedro Yard

SHIPBUILDING . . . SHIP CONVERSIONS . . . SHIP REPAIRS
NAVAL ARCHITECTS and MARINE ENGINEERS

BETHLEHEM STEEL COMPANY
Shipbuilding Division
GENERAL OFFICES: 25 BROADWAY, NEW YORK CITY

Westinghouse Names New Manager

Joseph R. McGilvray, associated with Westinghouse for 22 years, has been named manager of the Westinghouse Electric Corporation's Manufacturing and Repair Department, Pacific Coast District.

He will head activities of his department throughout an area comprising all or parts of nine western states, Alaska and Hawaii. In addition to the district headquarters plant at Emeryville, four other plants are located in the area—at Los Angeles, Portland, Seattle and Salt Lake City.

A native of Quincy, Mass., where he completed his formal education in 1906, Mr. McGilvray served in various capacities at the Fore River Plant of the Bethlehem Steel Company's Shipbuilding Division until 1921, when he joined the New York naval architect firm of Gibbs and Cox as a marine electrical engineer, helping with the major job of reconditioning World War I ships for peacetime use. He resigned that connection in late 1924 to become a service engineer for Westinghouse at New York City.

JOSEPH R. McGILVRAY

In mid-1927 he was transferred to Boston as a marine-repair specialist for Westinghouse, and late the following year was made electrical superintendent for the entire New England District of the company's Manufacturing and Repair Department. In October, 1934, he was made manager for the department's New England District, a post he held until his recent transfer.

Mr. McGilvray is among the few holders of the coveted Westinghouse Order of Merit, highest company award to its men for outstanding service. He received this award in late November, 1943, for "his ability to build an efficient and co-operative organization; for his clear understanding and fairness in dealing with personnel problems; and for the confidence and good will he inspires in Westinghouse customers."

The new Manufacturing and Repair Department manager is a member of the American Institute of Electrical Engineers, the Engineers' Club of Boston, and other technical and professional societies.

Ed was limping badly. "What's up?" asked Bill, "Hurt yourself?"

"No, got a nail in my foot," replied Ed.

"Why don't you take it out?" replied Bill.

"What! On my lunch hour!"

M. J. Gigy

M. J. Gigy to Cargocaire at S. F.

The Cargocaire Engineering Corp. has announced the appointment of M. J. Gigy as West Coast district manager with offices at 417 Market Street, San Francisco, California.

In addition to Cargocaire, Mr. Gigy will also represent the various divisions of Cargocaire, Carswell Marine Associates and The Landley Company for the West Coast area. In making this announcement, J. S. Carswell, executive vice president of Cargocaire stated that "Mr. Gigy's appointment as our West Coast Manager is in line with our post-war policy of establishing a sales and service organization in each of the big shipping ports of the United States."

Prior to his association with Cargocaire, Mr. Gigy was Chief Engineer of the Lake Washington Shipyards in Houghton, Washington. He has also been associated in the past with W. C. Nickum & Sons in Seattle and in the Western Division of the Worthington Pump and Machinery Corp. For the past several years, particularly during the tremendous shipbuilding program for World War II, Mr. Gigy did considerable work in the development, design and construction of marine power plant equipment. He is a member of the Society of Naval Architects and Marine Engineers, the American Society of Naval Engineers, and the Propeller Club of the United States.

Marine Paintings Contest

A contest for the best marine paintings in water color or oil is being conducted by the Seamen's Church Institute of New York, 25 South Street, through its Artists and Writers Club for the Merchant Marine.

Active merchant seamen of all ratings and nationalities are eligible and may enter as many works as they choose. Deadline for entries is March 1, 1947. There will be first, second, and third prizes carrying $25, $15 and $10. All paintings submitted will be on exhibition from March 1 to April 1 in the Janet Roper Room, 25 South Street.

Visitors and critics will be asked to cast their vote for the best paintings.

Entries should be addressed to: Secretary, Artists and Writers Club, 25 South Street, New York 4, N. Y.

Warren to Commerce Dept.

John J. Judge, San Francisco Regional Director for the United States Department of Commerce, nounced recently the appointmenr of Walter Warren as chief of the Department's regional business and economic information staff.

Warren was business editor for the Associated Press in San Francisco. He will help carry out the Department's information and counseling programs, designed to report to the public and businessman the business services and technical materials the Commerce Department has on hand. The San Francisco office serves Northern California and Nevada.

WALTER WARREN

Before joining the Associated Press 20 years ago, Warren worked on several Northern California newspapers in capacities ranging from cub reporter to city editor. He is a Stanford graduate, receiving a Master of Arts degree there in Economics. He served in the 364th Infantry in World War I.

Changes in S. F. Regional Office Of U. S. Maritime Commission

Organizational changes in various departments of the San Francisco regional offices of the U. S. Maritime Commission were announced by L. E. Fleming, Pacific Coast director.

Effective immediately, Royal W. Cutler is designated acting traffic manager, replacing E. E. Ferrari, who resigned to accept the position as Assistant Director of the Port of Stockton.

Howard A. Pellon has been named assistant to Fleming. He was formerly in charge of Recruitment and Manning, which office in future will be in charge of Ruth H. Kynock.

Effective December 14, E. T. Joste will assume charge of the Ship Delivery and Charter Unit vice Lloyd M. Mauk, who resigned to become associated with the Pacific Far East Line.

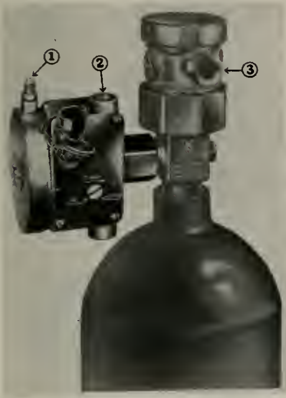
William Mann has been named Acting District Counsel, succeeding William Ball, resigned, and R. F. Travillian is now District Food Control Representative for the Commission, replacing Leroy Morrow, resigned, Fleming announced.

Keep Posted

New Equipment and
Literature for Yard,
Ship and Dock

Electronic Tachometer By General Electric

A new electronic tachometer designed for measuring rotating speeds from 300 to 50,000 rpm has been announced by the Special Products Division of the General Electric Company. Weighing only 19 lb., the new tachometer is useful for the production testing of equipment instantaneously without the necessity for any permanent attachments. It can be used to indicate the speeds of electric motors, machine tools, automotive and aircraft engines, pumps, fans, blowers and other types of rotating equipment.



NEW KIDDE release mechanism for marine fire protection systems shown attached to a carbon dioxide cylinder. Numbered parts are (1) connection for tubing to heat detector, (2) conduit connection for remote-control pull-cable and (3) outlet from cylinder to discharge nozzles.

Automatic Cylinder Release Mechanism by Kidde

Development of an automatic cylinder release mechanism for use with the vertical flood valve on marine carbon dioxide systems is announced by Walter Kidde & Company, Inc., of Belleville, N. J.

The new release, incorporating a diaphragm type spring-loaded valve, permits either automatic operation of the system when actuated by a rate-of-temperature-rise detector or manual operation from either a remote or local pull handle.

The Kidde marine system operates even in the event of failure of the boat's power or electrical systems, since it is an independent installation working wholly from self-expelling, cylinder-stored carbon dioxide. It is simple to maintain, easy to inspect and its discharge leaves no messy after-use residue.

Hot Off The Press

DUDGEON BOILER TUBE EXPANDERS, is the title of an informative circular covering the full line of Richard Dudgeon Inc. of New York City, water tube expanders and accessories.

Left Pages Better Than Right, Summary Proves

New York—One of advertising's oldest arguments got what looked like a clincher this week. For years media men have been painstakingly telling space buyers that a left-hand page was just as well read as a right-hand page, and now they have statistics to support them.

The recently-released report of the 100-study summary of the Continuing Study of Newspaper Reading by the Bureau of Advertising, American Newspaper Publishers Association, shows that left-hand pages lead right-hand pages by a narrow margin.

The bureau's figures show that on 3,002 pages, men and women saw 1,504 left pages, 1,498 right pages; on 1,451 pages with general news and advertising, men and women saw 728 right pages, 723 left pages. The men's median is 5 percentage points higher for left over right; the women's percentage is 3 points higher for left than right.

NEW LESLIE BULLETIN ON PRESSURE REDUCING VALVES: Bulletin 461, 20 pages completely illustrated in color, giving engineering, operating and maintenance data on pressure reducing valves, differential valves and overflow valves for steam, air or gas services, has just been issued by the Leslie Co., of Lyndhurst, New Jersey, manufacturers of regulators, controllers, strainers and whistles.

HIGH - PRESSURE CONDENSATE RETURN SYSTEM: The Cochrane C-B (for Condensate-Booster) high - pressure condensate return pump has been redesigned for greater operating freedom. A new larger pump driven by a 25 hp motor has been added to handle capacities previously impossible with smaller horsepower units. Other features have been made and are explained in detail in publication No. 3250 published by the Cochrane Corporation of Philadelphia, Pa.

* * *

THE FRANCE PACKING COMPANY OF PHILADELPHIA has just issued an illustrated folder, describing various types of metal packings. This folder, entitled Industrial Packing, tell of metal packing most frequently used. The desirability of packings made to fit standard stuffing boxes is obvious when their advantages are understood as described in this folder.

* * *

NEW RADIOMARINE RADIOTELEPHONE FOLDER: Radiomarine Corporation of America of New York has just issued a new two-color folder which describes in detail their 75-watt ship-to-shore radiotelephone model ET-8012-D. Certain to be of interest to commercial vessel and large yacht owners, the folder includes the technical and mechanical specifications of the equipment, dimensions and weights, power supply requirements, features of construction and performance.

* * *

PERSSON SAFETY DIE JACK: The Persson Mfg. Company of Bloomfield, New Jersey, has announced their safety die jack, a new simple tool for separating and assembling die sets. It is a compact tool that fits easily into a tool box or bench drawer.

ALNOR THERMOCOUPLES, protection tubes, wire and accessories is Bulletin No. 4181 put out by the Illinois Testing Laboratories, Inc., of Chicago, Illinois. The bulletin treats the subject of "Alnor" Thermocouples.

RECENT DEVELOPMENTS IN MACHINE GAS CUTTING processes are discussed in the new informative pamphlet by Air Reduction Sales Co., New York, called Special Oxyacetylene Machine Cutting Applications by R. F. Helmkamp. The author is an outstanding specialist in machine gas cutting processes and describes the economical and time-saving uses of the much discussed Electronic Tracing device recently introduced to the industry by Air Reduction.

NEW CATALOG ON AUTOMATIC FLOW RESPONSIVE EQUIPMENT and methods is contained in Bulletin #1200, entitled Treet-O-Control, just issued by %Proportioneers, Inc.%, well-known manufacturers of automatic proportioning equipment. This is a handy reference book containing a wealth of material dealing with automatic flow responsive equipment and methods in continuous pro-operation. The company's method is clearly explained and the operation is demonstrated by diagrams. For the first time, this catalog permits the purchaser to select and size equipment for most treating, sampling, blending and diluting applications.

A GENERAL GASKET CATALOG FOR INDUSTRIAL AND MARINE APPLICATIONS is anounced by the United States Gasket Company of Camden, New Jersey. It gives a complete illustrated description of the entire line of "U. S." gaskets, both standard and special in various types of construction and of different materials and metals. These "U. S." gaskets cover all temperature and pressure requirement which are encountered in the industrial field. In addition, handy gasket engineering reference tables show comprehensive data on sizes, shapes and temperature conversion together with other pertinent gasket information.

RADIOMARINE RADIOTELEPHONE FOLDER — A new two-color folder which describes in detail their 25-watt ship-to-shore radiotelephone Model ET-8027 has just been published by the Radiomarine Corporation of America. Certain to be of interest to pleasure craft and work-boat owners, the folder is designed to answer many questions about the equipment including technical and mechanical specifications, dimensions and weights, power supply, antenna and ground requirements, quality features of construction and performance, typical installations and the history behind the product.

REYNOLDS PUBLISHES MANUAL ON MACHINING ALUMINUM ALLOYS: To answer requests for recommendations on machining the aluminum alloys, engineers of Reynolds Metals Company have prepared a 124-page manual on machining aluminum alloys. An outstanding feature is the section containing eight charts which make available compact easily usable recommendations for eight of the most important machining operations. Each chart occupies a 2-page spread and gives detailed data on recommended tooling, speeds and feeds for that particular type of machining operation.

The book, approximately 6 x 9 inches, is spiral bound for easy opening. It is available from Reynolds Metals Company, Department 47, 2500 So. Third St., Louisville, Ky. Price $1.00.

G-E ARC-WELDING ELECTRODES is the title of General Electric's catalog on arc welding. A wealth of information is contained in over 100 pages of this attractively illustrated catalog. Victor Equipment Company of San Francisco is one of the distributors for G-E's catalog. The electrode manual represents the joint efforts of the G-E Company and its welding distributors. It has been compiled from data obtained by this company in one of the finest electrode developmental laboratories in the world; data which have been tested by G-E's welding distributors in collaboration with users.

DIRECT CURRENT REMOTE INDICATION & CONTROL SYSTEMS: Allis-Chalmers Mfg. Co. of Milwaukee, Wis., have just issued a 12-page engineering bulletin, No. 14B6641, explaining remote indicating and control systems, what they are and what they accomplish. According to the bulletin, the firm's d.c. remote indication systems have been used with complete success in a great variety of applications in the oil, metal, power, marine and other industries. Although basically a direct current device, the system is extremely flexible in application because it can be easily operated on alternating current by the addition of a small rectifier unit.

Radiomarine Radio Direction Finder, model AR-8702-A.

Radio Direction Finder For Commercial Craft

A new compact radio direction finder engineered to the same high standards as ocean-going merchant ship models and operating from its own source of power has been designed by Radiomarine Corporation of America of New York, for use aboard yachts and small craft where limited space requirements make installation of larger types of direction finders impractical. Known as Model AR-8702-A, the unit is strictly a high grade and accurate navigating instrument and does not incorporate a radio broadcast receiver.

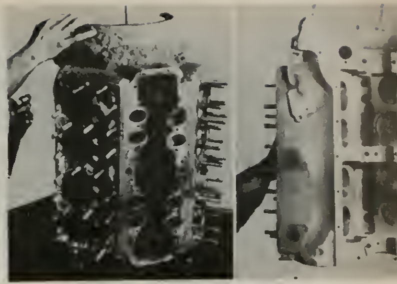
Housed in a corrosion-resistant, baked laquer-finished cabinet measuring 14 inches wide, 7 inches high and 12 inches deep, is a highly sensitive and selective six-tube superheterodyne receiver. The main full-vision dial, connected to a three gang condenser, is calibrated in kilocycles. The tuning range is 270 to 520 kilocycles which includes the Coast Guard beacon band. The set is supplied with a telephone headset, a battery box complete with one 6 volt storage battery and two 45 volt dry cell batteries as well as a battery charger, and an 18-gauge watertight copper loop for outside installation. A drum type Azimuth scale with indicating pointer is mounted directly above the receiver housing. On the receiver panel are mounted an on-off switch, pilot light, continuous wave signal switch, volume control, balancer control with provision for sense determination and phone jack.

The inside loop installation is designed for use aboard wooden vessels or where a minimum of metallic structures are in the vicinity of the direction finder loop. When the direction finder is to be installed in a steel enclosed wheelhouse an outside loop is always used. The outside diameter of the loop is 13 inches, the inside diameter 9 inches. The loop drive tube has sufficient length to accommodate a ceiling height of 84 inches and a deck thickness of 3 inches. The maximum height of the loop above the outside of the upper deck is 18 inches.

Ferrex, New Turco Product

A new, low-cost, non-inflammable hot tank cleaner that effectively removes carbon and paint—as well as grime, grease, gums, heat hardened resins and heavy dirt—from steel and other ferrous metals without the necessity of scraping and other manual methods, has recently been introduced by Turco Products, Inc., Los Angeles.

Marketed under the name of Ferrex, it is claimed that the superior carbon and paint stripping qualities of this new product result from a combination of two cleaning agents, Ferrex B, an alkaline solid, and Ferrex C, a direct action liquid solvent. Specifically designed for use on steel, cast iron, bronze, copper and red brass—on all but the reactive metals—Ferrex utilizes a water solution and a simple hot tank, preferably with air agitation, to penetrate and "wet out" carbon smut and lead deposits, emulsify petroleum residue and saponify animal and vegetable oils.



Non - inflammable hot tank cleaner (at left, before cleaning, and right, after the Turco process).

The manufacturer points out that Ferrex not only requires no expensive equipment, an ordinary steel hot tank being sufficient with an air agitation installation optional; but that further economies are effected because of its high "buffer index" that permits the solution to be used over and over again with little depletion of strength.

Ferrex is recommended as a fast, safe, economical and effective chemical agent for hot tank cleaning operations, not only in automotive motor reconditioning, but in cleaning petroleum, railroad, diesel and farm equipment and tools as well. Further information may be obtained by writing the manufacturer.

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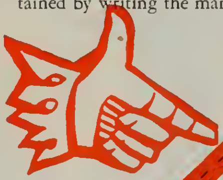

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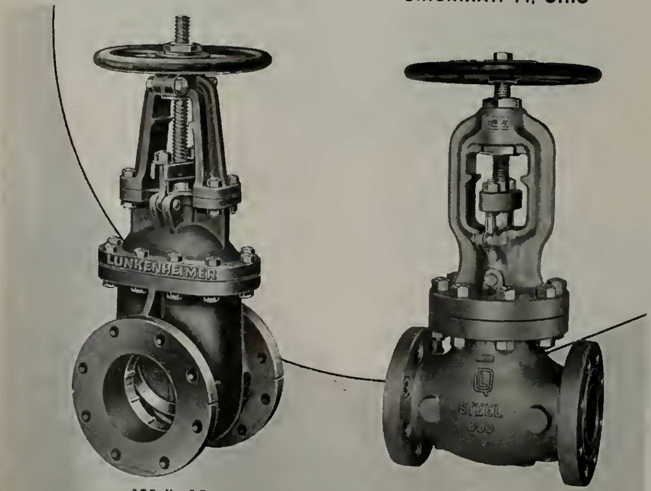


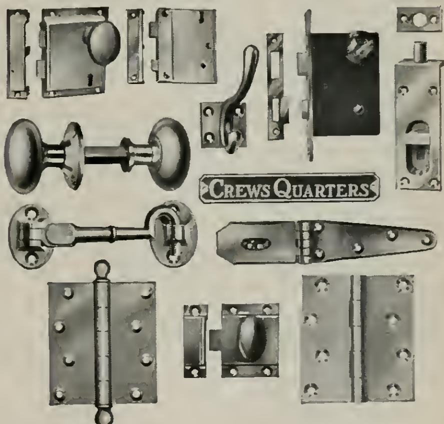
LESLIE Class MG-2 temperature regulator.

Leslie Co. Announces Class of Temperature Regulators

A new type of self-contained, direct operated temperature regulator for gas control to process heating, designated as Class MG-2, has been announced by LESLIE CO., Lyndhurst, N. J., manufacturers of regulators, controllers, strainers and whistles.

Supplied with screwed ends in ⅜, ½ and ¾″ sizes, these bronze body temperature regulators operate over standard temperature ranges from 20° to 600° F, at inlet pressures up to 25 psi maximum. They are designed specifically for coffee and water urns, deep fat fryers, dishwashers, hot water heaters, oil treaters, industrial baking ovens, cookers, drying ovens, steam tables and similar equipment where accurate gas-fired control is desired, and where product quality is dependent on temperature control and economy of operation is important.

All trim is bronze, with renewable valve disc and steam assembly. Various bulb and bulb casing materials are available and the rugged liquid expansion type thermostatic element has a piston guided bellows. A free moving valve stem has yielding springs which prevent overstressing of bellows at "over range" temperatures. An unexposed pressure sealed stuffing box prevents unauthorized tampering with the regulator, and costly over-rides in temperature are eliminated by adjustment of the pilot flame to the lowest point the burner permits.


CREWS QUARTERS

Designers of Marine Hardware For Boat Owners

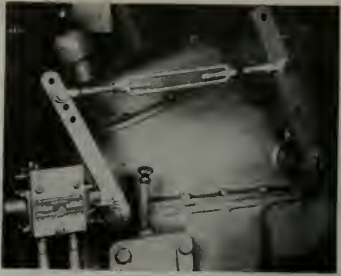
Design Engineering Company (Desenco), of Pasadena, manufacture marine hardware and fittings for the boat owner and racing sailor who wants only the best equipment obtainable on his craft. Designed and engineered for quality and dependability, their fittings are thoroughly modern and completely practical.

Parts for the DESENCO light weight single sheave, becket, and fiddle blocks are stamped or turned from rolled stock and are available in brass, chrome plated brass or stainless steel. All blocks have a high resistance to corrosion and may be changed from a front to side shackle by simply changing the clevis pin. Large, free running phenolic impregnated canvas laminated plastic sheaves are capable of handling $\frac{1}{4}''$ or $\frac{5}{16}''$ line.

Design Engineering Company fittings.

The turnbuckles for $\frac{3}{32}''$, $\frac{1}{8}''$ or $\frac{5}{32}''$ wire have no projecting parts or locking wire to foul running rigging and should be mounted above deck, thus insuring a watertight chainplate installation and excellent accessibility. Machined with extreme accuracy, the non-fouling turnbuckle reduces the points of wear and the brass construction reduces all corrosion to a minimum. Available in polished brass or heavy chrome finish.

Small, but important fittings such as shackles, pad eyes, fairlead slides and others are formed from rolled stock, assuring uniform material and pleasing appearance not usually found in the common run of cast fitting.



NEW CONTROL FOR HIGH SPEED ENGINES. A new, self-contained remote control, designed to handle loads up to 1200 inch pounds torque, is now being produced by Ellinwood Industries, Los Angeles. It gives boat owners a simple, dependable, easy way to operate their vessels.

Ellinwood's New "A" Control

A self-contained hydraulic remote control designed to handle loads up to 1200 inch pounds torque has been released for sale to the marine industry by the Marine Equipment Division, Ellinwood Industries, Los Angeles.

The new control, known as the Model "A," will handle the remote clutch shifting lever on marine clutches on most high speed gasoline engines up to 200 horsepower and medium speed gasoline and diesel engines up to about 100 hp, according to Orrin Broberg, division manager.

Located on the flying bridge or in the wheelhouse, the overall Model "A" design precludes the necessity for an enclosing hood or special pedestal, thereby reducing the initial investment in equipment and resulting in a saving of space.

The operating unit always precisely follows the remote unit. The simple, dependable designed Compensator unit automatically takes care of expansion and contraction of the hydraulic fluid without affecting the synchronism between the master and the slave.

Flintkote's New Anti-Slip Plastic Coating

The Flintkote Company of New York has developed a new synthetic plastic non-slip floor coating, FLINTDEK. This coating, available in three colors, red, green and slate, can be used effectively on all types of floor surfaces which might otherwise present danger when wet, or greasy. It is especially useful on steel decks and floors, around machinery, on steps and ladder treads, and many other places where sure footing is essential.

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Crane Packing Company new headquarters at Wilmington, California. Ray Roshong is manager in Southern California.

Lonn Mfg. Co.'s Giant Water Saver

Capable of delivering 198 gallons of water per minute at 40 lbs. pressure, the new Giant Water Saver nozzle is especially designed for filling tanks in steamships, tugs, tank cars or locomotives. The Giant Water Saver is made in two models — regular for full open flow; tapered for concentrated stream.

These Giant Water Savers, while capable of delivering large quantities of water or other liquids with ease and safety, employ the patented Lonn Piston Principle which means positive leakproof closing without waste. Lonn Piston Valves employ no packing, screws, push-buttons, springs or levers. There are only three working parts, which require no adjustment.

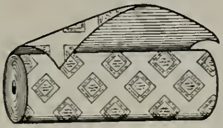
Lonn Manufacturing Co.'s giant water savers.

Giant Water Savers are operated by light pressure on the flexible nozzle, which regulates the flow from a mere trickle to full, open stream. If a hose is dropped, the flow instantly, automatically and completely stops.

Both the regular and tapered models are fitted with brass connections for 1½" I. P. threads. They are made by the Lonn Manufacturing Co., Indianapolis, Indiana.

Gas Porosity in Steel New Process Solves

The specimen on left shows the resultant pockets of porosity that may develop when dissolved hydrogen is not permitted to escape from steel while being cast. Such pockets can easily ruin an entire heat of steel. Application of a flushing process, developed by AIR REDUCTION Sales Company engineers, by which dry nitrogen or argon is bubbled through the metal, eliminates the dissolved hydrogen efficiently and at a reasonable cost. The specimen on the right clearly shows the results obtained when the Airco flushing process is used.

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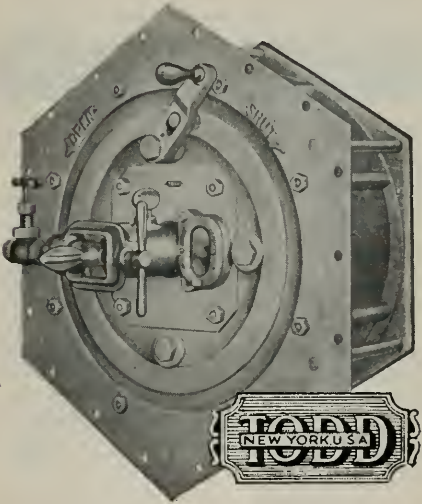
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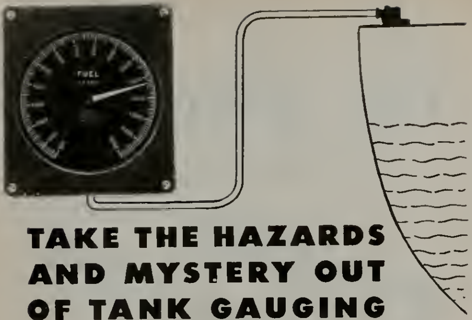

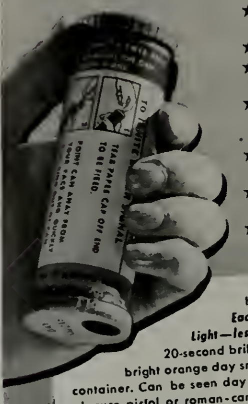

Steady As You Go

THE SEXTANT continued from page 88

a ship's position by use of horizontal sextant angles and the three-armed protractor just discussed.

The Horizontal Danger Angle

The horizontal danger angle is used to keep clear of shoals and obstructions much similar to the manner in which the vertical danger angle is used. The horizontal danger angle requires two prominent objects on shore whose positions are well known and charted. Its use is shown in Figure 22.

Assume the ship to be on a course XY, and that the navigator wants to stay clear of island D. Shown on the chart are two prominent objects, A and B on shore. In order to pass safely offshore the island (D), draw a circle around (D) the required distance off necessary to clear it safely. Next transcribe a circle tangent to the offshore side of the first circle. From the point of tangency C draw lines AC and CB, forming angle C. Measure angle C with a protractor and set this angle on the sextant. As the ship proceeds along the coast on track XY, continue to take horizontal sextant angles between A and B. As long as the angle measured does not become greater than angle C, the ship is well clear of the island. If, however, the horizontal angle becomes greater than angle C, it will be then necessary to haul offshore at once to avoid danger.

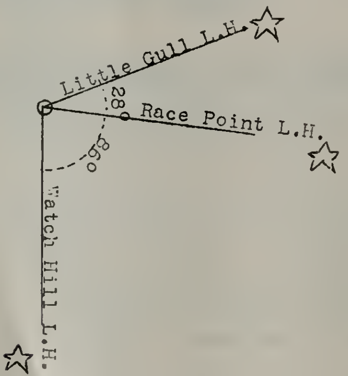

Fig. 22. Horizontal danger angle.

(The final article on the Sextant will appear in an early issue.)

Your Problems Answered

BACTERICIDAL EFFICIENCY

continued from page 86

bacteria was eliminated by collecting the samples before the feed water entered the first effect shell.

Even though the feed water before heating had an average most probable number of coliform bacteria equal to almost 500,000 per 100 ml., only one sample of the feed water heated to 165° F. or 175° F. was positive for coliforms, and the most probable number was reduced to less than 3.6. The total bacterial content as given by the

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BACTERICIDAL EFFICIENCY

(Continued from page 144)

plate count at 37° C. was reduced from an average of 50,000 per ml. to an average of 13 per ml. There was no discernible difference in either the coliforms or plate count between samples heated to 165° F. and those heated to 175° F. Neither was there any apparent difference in the number of coliforms or the plate count when the rate of feed was increased. It should be pointed out that the temperature was not high enough to make the water sterile, since the plate count was never zero. Also, spore forming bacilli were not eliminated. This was evidenced by the fact that a large number of gas-formers were observed, which, upon cultivation and miscroscopic examination, were found to be spore formers.

There was no chemical change in the water due to the preheating.

Vapor Separators Removed

After 46 runs had been made, it was decided to remove the separators from the first effect so that (1) it could be determined if the separators are responsible for the elimination of bacteria from the distillate and (2) to make it possible to operate the plant so that water having a salinity from 0.5 grain per gallon to 10.0 grains per gallon could be produced. In this condition there were no baffles nor any device to prevent droplets of water from passing through the opening from the shell into the vapor feed heater, which collects the vapor produced in the first effect. With the separators removed it was found that water having a salinity of less than about one grain per gallon could not be produced. Consequently, the lower half of the separator opening was covered with sheet metal to reduce the number of droplets entering the vapor heater. This made it possible to produce water having a salinity from one grain per gallon to 0.6 grain per gallon.

Sixteen runs were made with the separators removed. Three of these were made with the sterilizing feed heater in opration at 165° F. The partial tabulation in Table II is representative of the bacteriological results of this series.

TABLE II

			BACTERIAL CONTENT	
Run No.	*Sample No.*	*Distillate Salinity Reading*	*Coliform Density M.P.N. Per 100 ml.*	*Plate Count at 37° C. Per ml.*
3½	577	4.7	16.0	5
3½	591	5.0	1.1	29
3½	594	4.4	5.2	22
3½	626	1.3	1.1*	70
4	540	2.5	9.2	2
4	568	1.7	1.1	10
4	569	1.7	1.1*	16
4	587	1.8	1.1	36
4	637	0.82	2.2*	60
4	638	0.73	2.2*	55
4	640	0.66	2.2*	47
5	528	1.6	5.2	32
5	563	1.2	1.1*	1
5	564	1.3	1.1*	11
5	579	0.98	1.1*	11
5	580	0.90	0.69	15
5	581	0.70	1.1	13
5	582	0.67	1.1*	12
5	631	1.0	2.2*	130
5	632	0.83	2.2*	100

---

*Indicates less than. (See Footnote, Table 1).

It will be observed from this tabulation that:

(1) the plate count at 37° C. was at no time zero.
(2) when the salinity of the distillate exceeded 1.5 grains per gallon, coliform organisms were usually present.
(3) when the salinity was less than 1.5 grains per gallon, there were fewer samples positive for coliforms.

Conclusions

The results of this study show that water produced by the plant under consideration complies with the U. S. Public Health Service Drinking Water Standards when the plant is operated so that the salinity of the distillate does not exceed ¼ grain per gallon. This salinity control is of no value if the plant is being operated on fresh or brackish water.

Although the results show that the distillate is free of coliform bacteria and the number of other bacteria is inconsequential even when highly polluted feed water is used, it is recommended that operation in harbors and other contaminated areas be avoided. There is always the danger of a coil in the vapor feed heater, distiller condenser, or distillate cooler leaking and allowing polluted water to enter the distillate. In any distillation process the danger from a mechanical failure or human negligence is greater in a harbor than when the ship is operating in water relatively free from contamination.

The fact that some bacteria were carried over into the distillate when the separators were removed and the salinity exceeded the usual ¼ grain per gallon indicates the need for efficient separators or eliminators in all low pressure plants. In cases where the eliminators are not known to be effective in keeping the salinity consistently below ¼ grain per gallon other means must be provided for killing the harmful bacteria.

If heat is used to kill bacteria, a minimum temperature of 165° F. is satisfactory. It was found that this temperature was sufficient to kill all coliforms, but not the other more heat resistant bacteria. In other words, a temperature of 165° F. will not produce sterile water, but apparently it is sufficient to kill the intestinal pathogenic bacteria. It is believed impractical to rely on the heating of feed water to make the water safe to drink because of certain operating difficulties. For example, it seems impractical to prevent any feed water that is not heated to 165° F. from entering the first effect shell. It appears that the heating of the distillate can be accomplished satisfactorily and may be deemed necessary for a plant that is not known to maintain the salinity consistently below ¼ grain per gallon.

It has been demonstrated that any ammonia in the feed water will be carried over into the distillate. Therefore, due allowance must be made whenever water produced by distillation is chlorinated. If ammonia is present in the water, any chlorine that is applied will react with the ammonia to form chloramines. Chlorine in this form requires a much longer contact time with the water to kill bacteria than is necessary if the chlorine is in the "free" state.

Any substances, for example oil, that volatilize at the same, or lower, temperature than water will be carried over into the distillate, if present in the feed water. This may cause the water to be unpalatable even if it is safe and

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Bactericidal Efficiency

(Continued from page 146)

is, therefore, an additional reason for avoiding distillation in harbors.

The most reliable control on the operation of a low pressure plant appears to be the salinity content of the distillate. For this reason, it is recommended that every low pressure plant be equipped with a low range salinity indicator with alarm and a salinity operated flow diversion valve to divert the distillate from the drinking water system when the salinity exceeds ¼ grain per gallon. This valve should be controlled in such a way that the water will be diverted regardless of the position of the selector switch on the salinity indicator panel.

The proper use of an automatic flow diversion valve should replace the too common practice of diverting the distillate from the boiler water tanks to the drinking water tanks when the salinity exceeds 0.3 grain per gallon but is less than 5.0 grains per gallon. It is believed that this practice could result in the delivery of non-potable water to the drinking water tanks and could be the cause of intestinal outbreaks on vessels equipped with low pressure evaporators.

Builder or Wrecker?

I watched them tearing a building down,
A gang of men in a busy town,
With a ho-heave-ho and a lusty yell
They swung a beam and a side wall fell.

I asked the foreman, "Are these men skilled,
As the men you'd hire if you had to build?"
He gave a laugh and said, "No, indeed!
Just common labor is all I need.

"I can easily wreck in a day or two
What Builders have taken a year to do."
I thought to myself as I went my way,
Which of these roles have I tried to play?

Am I shaping my deeds to a well made plan,
Patiently doing the best I can?
Or am I a wrecker who walks the town,
Content with the labor of tearing down?

—From the San Francisco *Datagram*, bulletin of Amer. Soc. Refrig. Engineers.

Nordberg's New Series Marine Gasoline Engines

Nordberg Manufacturing Company announces a series of six-cylinder marine gasoline engines, each having a wide range of speed and power, and available for direct or reduction gear drive. Reduction ratios from 2.6 to 4.33 to 1 are available, making the models applicable to a wide range of service—from the high speed 17′ runabouts to twin screw medium cruisers up to 80′ in length, and to work boats up to 50′ in length.

The model 230 is rated at 52 bhp at 1600 rpm and 88 bhp at 3000 rpm; model 320-70 bhp at 1600 rpm and 102 bhp at 2400 rpm; and model 340-74 bhp at 1600 rpm and 130 bhp at 3000 rpm.

The Nordberg reverse and reduction gear assembly is designed as an integral part of the engine, forming a compact and efficient unit. All three models of Nordberg Gasoline Engines use the same in-line planetary type reverse gear and reduction gears.

The new series of Nordberg Marine Gasoline Engines will be exhibited at the National Motor Boat Show, in New York, January 10-18, 1947.

The Nordberg engines offer many design features of special interest to the marine field, and provide a compact, dependable unit of outstanding performance. The engines incorporate such features as:

1. Helical timing gears, providing separate drive for water pumps and generator.
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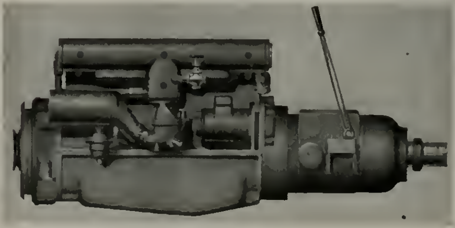
3. Four-point engine suspension.
4. Large removable crankcase cover plates providing accessibility for inspection.
5. Auxiliary drive available, operating at approximately 1½ engine speed.
6. Combined intake and exhaust manifold—water jacketed for heat control.
7. Control valve provides means of regulating engine and intake manifold temperature, so that under any operating condition most efficient operating temperature may be obtained.
8. Provision for attaching a drive pulley or twin disc clutch power take off on the forward or flywheel end.
9. Reverse adjustment with automatic spring loaded take-up.
10. Generator of ample capacity to meet electrical requirements when the engine is operated at extremely low speeds.

These engines, manufactured by Nordberg Manufacturing Company, 3103 So. Chase Ave., Milwaukee, Wisconsin, incorporate the experience gained in over twenty years manufacturing internal combustion engines.

Nordberg marine gasoline engine.



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* Gamlenizing boiler metal surfaces makes them corrosion-proof, protecting against destructive action of acids in the combustion deposit, and greatly reducing the adherence of future deposit. Only Gamlenite has this feature.

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Your Merchant Marine Pays Off

(Continued from page 39)

and charter merchant vessels from the government-owned fleet in order that the merchant fleet of the United States may assume its proper role in world commerce. We must on December 31, 1947, meet the goal of placing all ships not sold, or whose charter agreements have expired, in the statutory reserve fleet of the United States pending such national emergencies as might demand the service of these vessels.

Our United States merchant fleet, despite its wartime construction record, is short certain types of vessels badly needed to maintain and continue essential services throughout the world. The Commission has determined and filled 31 trade routes essential to the economic welfare of our country. On some of these routes our present fleet cannot offer the type of service which it will meet in foreign competition. It is essential that the government and the private maritime industry foster services which will equal that of any other nation—continuing to build new, faster, and more efficient types.

Most pressing among these problems is the need for high speed, economical passenger liners. Every passenger vessel of our fleet, worthy of the name, was converted to the use of our armed services at the outbreak of war. Some of these were lost. Others would be uneconomical to reconvert and the end result is a critical shortage of this type for our postwar fleet.

For many reasons, the Maritime Commission had to set aside, *temporarily*, its plans for the construction of such vessels. However, I firmly believe that with the help of private operators we can and should go forward with plans to meet the present fleet deficits.

In a public speech recently at New York I stated that we paid the Queen Mary and Queen Elizabeth a million dollars per voyage to carry our troops in the Atlantic. For this I was criticized by London periodicals and my attention called to the fact that this cost was credited to Reverse Lend-Lease. Quite true. My purpose in mentioning the subject was not intended as criticism. We were indeed happy that our Ally could furnish this much needed service which we were incapable of performing. I wished then and I wish now only to bring home to the American public the critical need in time of emergency for fast and efficient passenger vessels, available to meet the demands of National Defense.

We believe that Americans will travel as never before. We, as a nation, have become world-minded, even though it took a war to make us so. I do not believe we need fear, too greatly, the competition of air travel. For the past five or six years this nation has heard nothing but rush and speed. I believe the people as a whole desire to settle down and slow our tempo of living. We need a little time to relax. Ocean steamships offer an opportunity to do that in a most pleasant form of leisure travel, in excellent companionship, with the best of service and the finest food. This we hope to offer, for under the American flag our laws require that we have the safest ships afloat.

We of the Commission believe that the future of the Merchant Marine is as much in your hands as it is in ours. We will gladly lead the way, but we cannot go far without your loyal and undivided support. If you believe, as we do, that the American Merchant Marine is essential to the economic welfare of this great country, we cannot fail to support it together.

In closing, I should like to bring the Merchant Marine home to the kitchen of every householder in the United States. Even though I dislike returning to the war for illustration, it best points up some facts about our Merchant Marine. I am sure we haven't forgotten, even though it's past, the rationing of our coffee. This country lacked a merchant fleet of sufficient size to meet its domestic requirements. Foreign flag vessels had been withdrawn to serve this country's needs and we didn't get our coffee. The same story was true for rubber, tin, and essential ores, for prior to the attack on Pearl Harbor we could not stockpile these vital materials because of a lack of ships. It's been a long time since ample supplies of such things as sliced pineapple rested on the kitchen shelves of America. It takes pineapple, sugar, tin, and ships to get it there.

Now we have the ships, we have the men, and we have the "know-how," but without a unity of effort on the part of labor, the elements that go to make up management, and the government, the American Merchant Marine cannot long prosper. When I say unity I mean it in the fullest sense of the word. It should include all branches of our industry—shipbuilders, ship operators, labor, bankers, shippers and the people. To succeed we must start at home. United we can express most strongly our firm belief in the future of the Merchant Marine industry. Together, we can recapture in spirit those glorious days of 100 years ago when America's own Merchant Fleet carried 90 per cent of her world trade and carried the Stars and Stripes of the United States into every port on the Seven Seas.

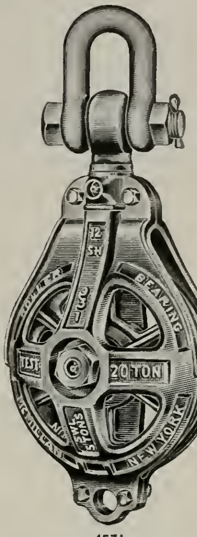
Movie Available for Use

National Federation of American Shipping announced that it had completed the first all-inclusive motion picture in sound and color which tells the complete story of the American Merchant Marine and its importance to the nation.

Titled America Sails the Seas, the 16-millimeter film runs 32 minutes and is complete with dramatic characterizations, narration, and set to thematic music.

The Federation said the film will be distributed without charge to schools, colleges, civic organizations, fraternal groups, and to a limited extent in some theaters. Distribution date is January 15, 1947.

"The primary purpose of America Sails the Seas is to show the importance of shipping to every segment of American agriculture and industry," the Federation said. "The picture tells the necessity for an adequate American Merchant Marine; how it operates; where it goes; what it carries; why it is vital for national defense and indispensable to peacetime commerce."


20 TON
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Matson's Plans for '47

(Continued from page 43)

amount of Hawaiian sugar will eventually reach West Coast ports in bulk.

Port Accessories

In San Francisco, the coming year will see full resumption of peacetime activities at the Matson Port Accessories Building. This operation, located near the company's piers, is unique among the ship-servicing work of any U. S. steamship organization. Here, Matson is fully equipped to handle ship's laundry, drycleaning, furniture repair; to disinfect and clean pillows and mattresses; to store a ship with everything from efficiently prefabricated meat cuts to canned goods, glass, silver and chinaware. All these and many other servicing functions are carried on through the Port Accessories facility with maximum effectiveness during a ship's brief stay in port.

Hotels

With full resumption of passenger service in 1947, Matson will again offer luxury facilities to tourists and commercial travelers both to Hawaii, Samoa, Fiji, New Zealand and Australia. On February 1, 1947, after a thorough redecoration program costing approximately $1,000,000, the Royal Hawaiian Hotel will be ready to receive tourists. This world-famed luxury hotel, under lease from Matson to the Navy during the war, served for four years as a rehabilitation center for service personnel. The nearby Moana Hotel, another property of Matson's Hawaiian Hotels Division at Waikiki Beach, will continue in operation as a popular tourist resort center.

During the spring of 1947 a seven-story wing now being added to the Matson Building in San Francisco, is scheduled for completion.

Globe Wireless Station KTK

(Continued from page 50)

attack on Midway and Guam transmitted by the Pan American Airways operators. Later it was learned that passenger vessels and freighters in the Southwest Pacific received all up-to-the-minute war reports from station KTK.

As darkness came over the Pacific that Sunday night, for security reasons, all marine stations were silenced, and KTK went off the air.

In 1929 when the Mussel Rock station was a mere infant housed in a little shack 20 feet square, one of the nightly duties of the operator was to contact the first Byrd Antarctic Polar Expedition in Little America and copy the reports of Admiral Richard E. Byrd for relay to the New York Times for publication in the morning newspaper. Although Byrd's radio station was located 30 feet below the snow, marvelous communication was carried on with KTK.

That same year, R. Stanley Dollar, on board the SS. President Taft, two days out of Honolulu en route to the Orient, was the first San Franciscan to establish contact with the Graf Zeppelin on its round the world flight. Mr. Dollar wirelessed the Commander, Dr. Hugo Eckener, "Welcome to the Pacific." Then for eight minutes Mr. Dollar, with the aid of the radio operator on the Taft, and Dr. Eckener chatted back and forth through the ether. The Graf's commander reported "everything going well," thanked Dollar for his welcoming message and said he would answer it later in a more extended radiogram.

During the entire trip to the Orient, the President Taft was in constant communication with KTK.

One of the traditions of the sea is for the ears of radio operators to be constantly attuned to 500 kc, the distress frequency, and if an SOS is heard, immediately relay a call for aid to all ships in the vicinity.

On September 29, 1932, word was flashed that the freighter Nevada had gone aground off the Aleutians. With her radio partially disabled and heavy breakers hammering at her hull, the radio operator sent out a feeble distress call that said she was sinking. The Dollar liner President Madison, bound from Kobe, Japan, to Seattle, proceeded under forced draft to the stricken vessel's assistance.

Then, after 36 hours of silence, to KTK came the first message from Captain R. J. Healy:

"Have rescued three only survivors of Nevada. Now hoisting boats. Details later."

As the rescue ship pushed through the night toward Victoria, B. C., a second message followed:

"Three men rescued," it repeated. It gave the names of the survivors, and continued: "Rest of crew drowned. The rescue work of our officers was magnificent. Healy." That was all. A terse report in the abrupt language of the sea. But, for a statement by a taciturn veteran sea dog, it spoke volumes. Thus ended a tragic saga of the northern seas with the death of 34 men.

In announcing the reopening of KTK, R. Stanley Dollar, president of Globe Wireless, Ltd., commented:

"During the five years our station was silent it has been thoroughly modernized with the very latest equipment to give added protection to all ships at sea. As we resume service the ears of our operators will be constantly attuned to the wave lengths used by ships, either for distress calls or for receiving regular ship-to-shore messages.

"On the first two expeditions that Admiral Richard E. Byrd headed to the South Pole our station at Mussel Rock was in almost constant communication with his base in Little America. Since reading the announcement of his forthcoming third expedition to the Antarctic, we have communicated with Admiral Byrd advising him that our Globe Wireless station again stands ready to offer every possible assistance to him and his party of explorers."

Today the tiny shack at Mussel Rock, where the Dolladio system was born, has been replaced with a modern brick station housing powerful transmitters for the marine service and the three Globe transpacific circuits to Honolulu, Manila and Shanghai.

The company is incorporated as Globe Wireless, Ltd., with R. Stanley Dollar as president, and his son, R. Stanley Dollar, Jr., assistant to the President and a member of the Board of Directors. Brigadier General W. P. Boatwright is Vice President and is directly in charge of operations.

Offices are located in San Francisco, Los Angeles, New York, Washington, D. C., Honolulu, Manila and Shanghai.

New Ships for the Pacific And 'Round-the-World

(Continued from page 49)

maintained on regular fortnightly schedules. Starting from New York and Boston, the regular ports of call include Havana, Cristobal, Balboa, Los Angeles, San Francisco, Honolulu, Yokohama, Kobe, Shanghai, Hong Kong, Manila, Singapore, Penang, Colombo, Bombay, Suez, Port Said, Alexandria, Naples, Genoa, Marseilles, thence back to New York.

Thus it will be seen there is no lack of forward thinking, planning and action on the part of American President Lines to provide, as speedily as possible, a type of equipment and service which will justify the fondest expectation of travelers and shippers everywhere and be second to none in the world.

At war's end, American President Lines was faced with the necessity of acquiring virtually a whole new fleet with which to carry on its global services. Although a temporary handicap, this situation was recognized as a long range advantage because it gave the Company an opportunity to build or acquire vessels specially styled and designed to suit the Company's rapidly expanding and discriminating trade requirements. A large part of this new replacement tonnage should be in operation by the end of this year.

General Steamship—

(Continued from page 51)

fleet of C-1-A type motorships which are now going into operation. Shippers to the Argentine will thus be afforded regular and dependable monthly sailings (via Straits of Magellan) while importers of coffee and other commodities from the River Plate and Brazil will have this service placed at their disposal on the northbound run, where the vessels return to the Pacific Coast via the Panama Canal.

In the Latin American trade, we also will have the Independence Line in full operation during the coming year; this service taking care of the trade with Buenaventura, with calls at intermediate Central American ports. The third vessel in this newly created line will be entering that service shortly after the first of the year.

Tonnage is also being acquired from the American government for the operation of the Pacific Mediterranean Line, enabling this service to further improve its schedule. This line was established shortly after termination of the war and will be expanded in the coming year.

The Pacific Australia Direct Line, which was operated as an important link between the Pacific Coast and Australia throughout the war, has continued not only with the fine fleet of vessels which it previously had available, but also with the addition of fast, efficient ships that were built in Sweden during the war. This also applies in the case of the Pacific Orient Express Line, which was inaugurated during the past year with Swedish and Norwegian ships. New construction is also being undertaken for this service, which has already been established in the China-Philippine trade and will be extended to include Japan as soon as commercial operations in that sector are possible.

Despite the many problems involved, we feel very encouraged over the strides that have been made toward a resumption of free commercial enterprise in the field of international trade and shipping. We join our many friends in the foreign trade community in looking forward to substantial further progress in that direction during 1947.

Motorship Barranduna at Vancouver, B. C.

Pacific MARINE REVIEW

FEBRUARY 1947

MEN *and* ROPE

Oldtimer Steve Alban beside a spinning machine in the Tubbs Mills.

To the average user, all rope may look alike. Then just what does make one rope better — more dependable — than another would seem a logical question.

In the case of Tubbs rope, one of the important reasons for superiority is MEN. It is men skilled for many years in the fine art of making good rope that assure perfection in each stage of manufacture — from the very selection of the fiber to the exacting tests which each coil of Tubbs rope must meet.

For nearly a century, this combination of men and rope has made the rope trademarks of the Tubbs Cordage Company outstanding leaders. For ***extra*** rope value — for ***extra*** dependability — specify Tubbs to your supplier. It will pay dividends in longer wear, greater safety, more rope value.

Watch for this famous trademark when the required quantities and grade of Manila fiber are once more available.

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By T. Douglas MacMullen

Running Lights—
By B. H. Boynton

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Red
White
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Pacific
MARINE
REVIEW

Don't Let Down the Guard!

AS WITH OUR RELIGION, or our doctor, we are often inclined to forget our defenses until a time of emergency.

Just now there is a tendency toward relaxing and even floundering in our attitude toward the MERCHANT MARINE.

The Merchant Marine cannot afford this floundering attitude. Its fleets were completely absorbed into the war effort, its public following was lost, its selfish-purposed critics were given full reign.

It should not be necessary for the industry to keep pounding on the doors of Government Departments in order to regain the very things to which it is entitled by law. And a well-planned trend of the industry may be stopped short by an arbitrary order. The shipping industry is not being fairly treated.

It has been said that there is no problem of the Marine Industry that could not be solved by the stroke of a pen. There must, of course, be a willingness to use the pen, and to use it without unseemly delays.

When, after World War I, the railroads were faced with operating losses, Congress and the ICC acted with great promptness and liberality. Under a limited guarantee of income provided by Congress, the Government paid the rails $536,000,000, and before the guarantee expired the ICC granted rate increases of $1,500,000,000 additional annual revenue. The domestic shipping lines which saved the war but lost their business, are not asking subsidies; *they just want depressed rail rates to port cities eliminated.*

And they want action on their vital needs. Delays on requests for *hearings* are inexcusable. An air line application by Waterman Steamship Company has dragged for 6 years, but the British Commonwealth Pacific Airlines' application for air service between Sydney and San Francisco via Honolulu was heard *within twenty-four hours.* And this airline is owned by Australian Steamship Companies. A Matson application filed in September 1943 was heard in twelve months and *denied* in 33 months.

The freight rate cases, rail competition, air applications, Alaska services, subsidies, *the ship construction program,* are delayed, delayed, delayed.

The stroke of a pen, in the right hands, is needed. Our Guard has been down too long!

A Challenge that Must be Met—

AMERICA IS PRESENTLY BUILDING for private shipping firms, in seagoing vessels of over 1000 gross measurement tons, 33 ships with a combined gross measurement of 246,819 tons and a combined total propulsion power of 290,750 shp.

Dividing this total power into the types of machinery by which it is generated and applied to the shaft we find that 85.3% is generated in steam boilers and applied through turbines and double reduction mechanical gearing; 14.1% is generated in steam boilers and applied through steam turbines and electric speed reduction; and 0.6% is generated and applied through diesel engines.

The shipbuilding nations of the world are now building, or have on order, approximately three and a half million gross tons of sea going vessels of 1000 gross tons and over. Lloyds Register reports for the quarter ending December 31, 1946, that vessels powered with diesel engines composed 55.4% of world shipbuilding tonnage and this percentage is on the increase.

Great Britain is resuming her traditional status as world shipbuilder and during the quarter under review, was building 52% of the world total. Great Britain has under construction or on order, nearly a million tons of motor ships.

Since European motor ships in the decade following World War I helped drive our cargo steamers out of international trade, and since the competitive position (so far as wages, costs of construction, and manning scales are concerned) is more unfavorable today than it was then, the question naturally arises "What can America do to stay in the overseas shipping business."

Evidently a very radical change is needed in our approach to the problem. If we assume that the American standard of living ashore must be maintained on American flag ships afloat, our problem must be solved by the development of techniques whereby a ship can be operated by greatly reduced personnel and whereby the cost of longshore operations can be largely eliminated.

This will require much first-class engineering applied to the design of piers and ports and ships. It will require a wholehearted cooperation between politicians, operators, designing engineers, and organized labor.

The designing end is well within the capacity of American naval architects, marine engineers, and material handling engineers. Will America meet the challenge?

Two Largest Ships

President Cleveland and President Wilson nearing completion at the Bethlehem-Alameda yard. These two ships are the largest to be constructed since the war. Both are for the American President Lines' run to the Orient.

Intercoastal Shipping Services-- The National Economy and The National Defense


Lewis A. Lapham

By LEWIS A. LAPHAM, Assistant to the President, American-Hawaiian Steamship Company

CRYSTAL BALL GAZING IS DIFFICULT and uncertain at best, and so far as the intercoastal trade is concerned he is a foolhardy man who at the moment even approaches the ball.

It is surprising how little appreciation there is generally as to the vital importance of the domestic merchant marine in connection with the national economy and the national defense. Shipping in the domestic trade lacks the glamor and public appeal of the foreign trade. There is a common misapprehension that foreign trade operations dominate the American Merchant Marine. Actually, the situation is the reverse, for more than two-thirds of our American shipping is normally engaged in the domestic trade.

If shipping were merely another industry with its own special ailments, the problem while serious, would not present the critical aspects with which we are confronted here. But shipping is more than an industry. It is a vital link in the country's network of transportation; it is an instrument of national policy; and it is an indispensable part of the country's facilities for defense.

Vital though it is to maintain American flag tonnage in the foreign trades, vessels engaged in the domestic trade are a first line of defense in national emergencies. The immediate availability of such vessels and their freedom from seizure or internment by foreign governments enhances their importance in the national defense picture.

Facilities

No less necessary than the physical equipment for the transportation of men and supplies are the fund of managerial knowledge, the pool of seagoing personnel and the available facilities for shipbuilding, drydocking, repairs, stevedoring and terminal facilities necessarily maintained to operate and support the domestic trades. Physical plant is not in itself sufficient; machines must be operated and serviced, and experienced management must be available. In a recent hearing before the Interstate Commerce Commission, Major General Leavey, the Army's chief of transportation, expressed the War Department's position as follows: "The War Department is appearing in this hearing because it considers that a live, going and adequate Merchant Marine is an absolute essential in the national defense."

An intensive study is being made of the comparison between prewar and postwar operating costs and it is hoped that publication will be possible in our next issue.—Editor.

The Navy's views were presented following those of General Leavey by Rear Admiral Callaghan, "The Navy is very much interested in the condition of the Merchant Marine at all times. It is one of the important pillars which form the foundation of our sea power. Without it, sea power as we know it simply does not exist."

The successful outcome of each of the last two wars certainly was largely due to the fact that we were able to provide merchant vessel tonnage which gave the necessary logistical support.

It is important to remember that with only 1,002 merchant ships flying the United States flag in 1939, 70 per cent of the total tonnage of our merchant marine was engaged in the intercoastal, or coastwise trade, and ships so engaged were the principal source from which the armed forces were able to draw.

The Merchant Marine employed in our domestic trade should be given the right to live and prosper.

It is fallacious to argue that a large number of ships constitute a merchant marine. An active merchant marine consists of modern ships, manned by trained men, men with years of seagoing experience to serve as their officers and crews. It consists of shipyards with their drydocks and ship repair facilities, it consists of ports with the requisite port facilities, it consists of ocean terminals, docks, warehouses, trained stevedore personnel, ship chandlers and the many other activities and personnel associated with shipping. If our merchant marine is allowed to disintegrate these supporting services, so important in wartime, disintegrate in almost direct proportion.

The record during the past 15 months under government operations in the intercoastal trade has left a gloomy financial result; even though the ships have been for the most part running full, and cargo offerings have been consistently heavy.

Two factors are paramount among the problems that beset the trade:

(1) Depressed rate structure.

(2) Increased operating costs.

The intercoastal rate structure has been tied from time immemorial to the transportation railway and always will be, for the primary justification of the intercoastal trade has been its ability to provide a more economical form of transportation from coast to coast.

The rail rates today are admittedly below what they should be for the long haul business and this differential is a bill that the short haul shippers are paying. Until the rails see their way clear to raising the long haul rates, the intercoastal carrier is not going to be able to raise its rates; and until the intercoastal carrier can raise its rates, it cannot hope to exist economically in the face of the increased operating costs of the past 6 years.

Those costs have been rising steadily since the early 1930's for the labor disturbances of that decade brought increasing wage bills on the one hand and decreased efficiency on the other. The effects were slowly but increasingly felt and the war put the finishing touches to the overall picture. Today, five years later, the intercoastal operator finds that his operating costs in every category have risen at least 100 per cent and in some cases twice that much. Efficiency is certainly no better, and in some cases is actually a little worse. The results lead to the gloom of the financial record of the past 15 months.

The government originally proposed to abandon its intercoastal operation of some 55 ships on December 31. The operation has been extended, however, through February, and in a message from the White House in mid January, the President requested that the Maritime Commission extend its operation through June 30 of this year, clearly recognizing the difficulties and the problems affecting the trade.

The almost certain alternative to the President's suggestion is the abandonment of the trade, at least as far as general cargo is concerned, for no operator so far as is known could hope to carry on in the trade today with his own ships and on his own money.

What the future holds remains to be seen, but *at the present writing* it does not seem to hold much that is good.

IFS

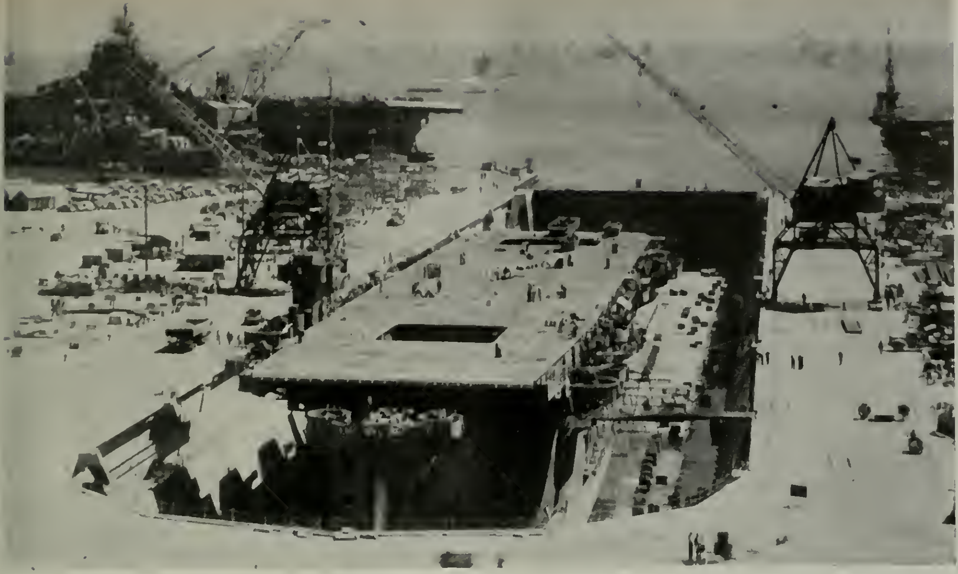
There is, of course, an "IF" in the picture, or rather several "IFS".

If the Interstate Commerce Commission, now charged with the development and maintenance of the country's water transportation, reviews the intercoastal rate structure and comes up with some realistic decisions, and

If the transcontinental rail lines revise their present long haul practices, and

If the Maritime Unions will cooperate in a return to some reasonable degree of efficiency, then the trade would have a fair shot at the future and there are some who will be back in it with their own ships and their own money.

The Victory Ship—War-built type which has been carrying the bulk of the intercoastal traffic for the past year.



No. 4 basin at Hunter's Point Dry Dock.

Adjustable Vane Dry Dock Pumps

By J. D. SCOVILLE and V. CHESTER SMITH

THE ADJUSTABLE VANE axial flow pump provided with means of changing the pitch of the impeller vanes while operating, offers certain advantages for unwatering dry docks. Two large docks, using such pumps, were completed and placed in operation for the U. S. Navy. Since these docks were suitable for the largest ships, relatively large pumping capacity was required to unwater them in a reasonable length of time. The flexibility of the adjustable pitch type suggested the feasibility of a few large units. Studies made by the Bureau of Yards and Docks resulted in the selection of four 1250 hp pumps for Pearl Harbor Dry Dock No. 4 and three 1500 hp pumps for the San Francisco Naval Shipyard at Hunters Point Dry Dock No. 4, all of which were of the adjustable vane type. There were many interesting problems involved in the selection of these particular pumps, in the design of the water passages to and from them and in the construction of the Dry Docks. It is intended that this article shall deal only with the pumping equipment.

The two dry docks were practically duplicates in size. There is a slight difference in volume because of variations of water levels but the total amount of water to be handled was approximately 60 million gallons in each dock. This had to be removed in 160 minutes which corresponds to an average pump discharge of 375,000 gpm throughout the full range of head.

The maximum depth of water is about 47 feet, but due to friction loss in the intake and discharge piping, the head varied from approximately 15 feet to 55 feet, based on design estimates by the engineers of the Bureau of Yards and Docks. Actually the head was slightly less, because of smaller friction losses than expected.

The extreme variation of head, and the large quantity of water involved necessitated a careful study of the type, size and speed of the pumping equipment. Cavitation and vibration present a distinct problem for fixed vane axial flow pumps for heads of this magnitude. The use of the mixed flow type of pump involves a greater cost because of its slower speed. The discharge of the adjustable vane type can be readily controlled within the limits

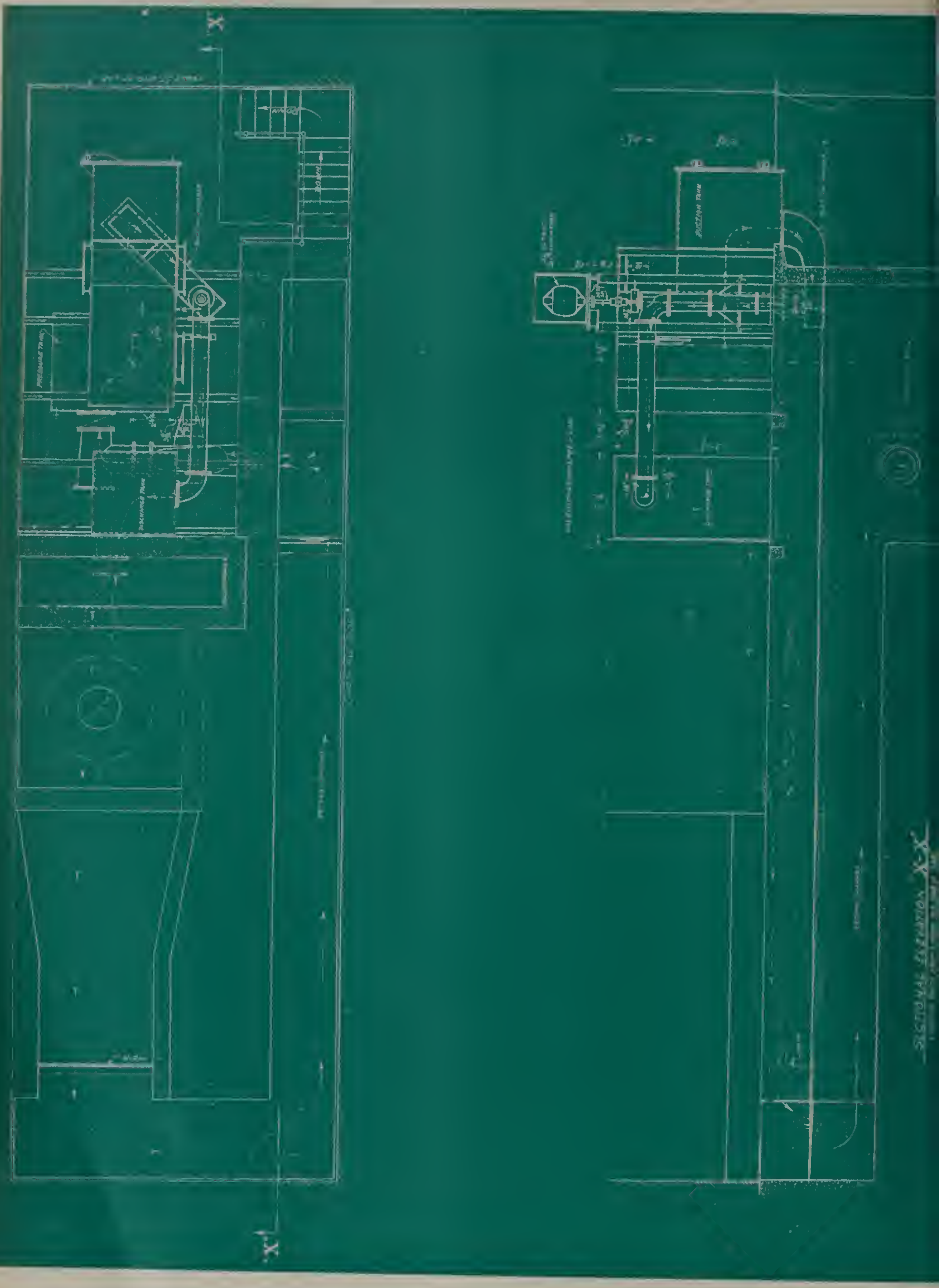


Fig. 1. Model Test Pump in cavitation test stand.

of the motor capacity without the use of throttling devices or speed change. Flexibility, from the standpoint of operation, is the outstanding feature of the adjustable vane pump.

At the time this installation was being considered no pump of this type had been previously used for heads as high as 55 feet, nor for dry dock service. Therefore, the Bureau of Yards and Docks of the U. S. Navy Department felt the desirability of building and testing a model under full head conditions and with the same impeller submergence as on the prototype, or field installation.

Such a model was constructed by and tested in the Hydraulic Laboratory of the S. Morgan Smith Company in York, Pennsylvania. Tests were first, for efficiency and capacity at about 30 feet head, and second for cavitation performance at prototype head. The model impeller was 9 inches in diameter and the set up including the pump intake, pump proper, and discharge piping, is shown in Fig. 1.

In addition to the usual cavitation tests, four points were run on the model at 15, 25, 37 and 55 feet head with the proper sigma, or impeller submergence, and at the vane angle to meet the discharges specified. Performance as computed is shown on the curves herewith.

A power variation of about 600 to 2300 hp occurs for the range of conditions cited. Advantage is taken of this in the use of 1500 hp motors on the pumps for Hunters Point Dry Dock. Fig. 2 shows that at 55 feet head the vane angle is about 12° for 1500 hp and greater than 20° for 15 feet head. This represents the variation in pitch required, in order to use the full capacity of the motor at all dock water levels.

View of flow to pump intakes at low dock water level.

Cavitation tests were then required to decide if this particular pump could be run at 12° pitch angle at 55 feet head and 22° with 15 feet head and at other intermediate positions, with the dock water level corresponding to each head, and operate without excessive vibration and with satisfactory efficiency at the intended impeller submergence. Fig. 3 shows the curves for 15, 25, 37 and 55 feet head and effect on discharge and efficiency of varying impeller submergence, each at a vane angle which corresponds to at least 1250 hp on the prototype. The cavitation limit is the point where the efficiency, or discharge or both, start to drop, if the suction water level is further reduced. For instance, at 15 ft. head, if the water level above the center of the impeller is reduced so that the submergence is less than 23 ft., cavitation will occur. This is shown by a decided drop in discharge and a slight drop in efficiency. At 55 ft. head a drop in efficiency shows that it is undesirable to operate the pump if the impeller is more than 1.5 ft. above the dock water level. This drop in efficiency caused by cavitation may be accompanied by pitting and vibration severe enough to prevent operation. A safety margin of submergence should be allowed. On Fig. 3 it will be seen that there is a safety margin of 28 feet against cavitation. Since at 55 ft. head the safety margin is 3 ft., it is evident that the high head conditions control the elevation of the pump impeller. The advisability of reducing the pump discharge still further when the water depth is low in the drydock increases the safety against cavitation at the highest heads. This reduction of flow is desirable to prevent the pump sucking air from the over-fall of water into the suction pits. The flexibility of the adjustable

Fig. 3. Cavitation limits of adjustable blade pump from model tests.

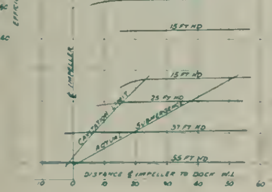


Fig. 2. Performance of adjustable blade pump computed from model test 15-55 feet head, at 600 rpm.

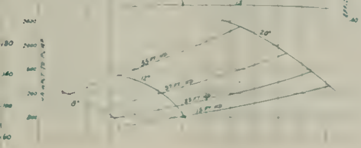
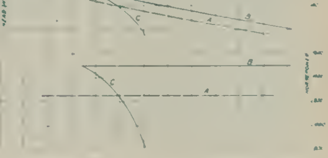


Fig. 4. Comparative performance of adjustable and fixed blade pumps of the same diameter and speed.



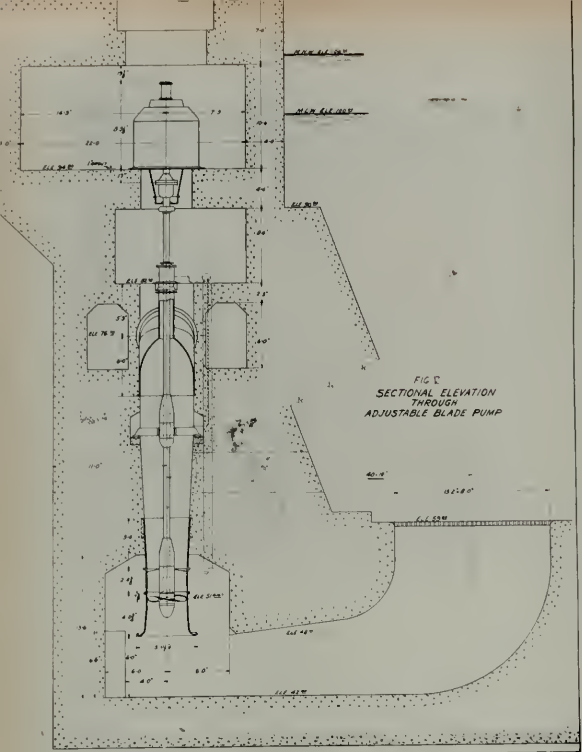


Fig. 5. Sectional elevation through adjustable blade pump.

vane pump permits operation at a safe capacity in the event that such disturbances, in the intake and elsewhere, cause vibration of the unit.

All of the preliminary studies were made on the basis of four 1250 hp units for the Pearl Harbor dock for which orders for the pumping equipment were already placed. About the time laboratory testing had been completed the Bureau of Yards and Docks had made their decision to use the adjustable vane pumps on the Hunter's Point Dock also.

After study of the cavitation performance of the model, it was decided to lower the pump impeller 3 feet for Hunters Point and use 1500 hp motors. The increased discharge made possible the elimination of one pumping unit and still permit unwatering within the required 160 minute period. This resulted in a substantial saving in cost as only the motor capacity had to be increased. The same size and design of pumps were used without change for both jobs.

The Laboratory tests showed that 12° vane angle would not produce objectionable cavitation at Hunters Point and that fixed vane pumps of such characteristics could be used. It will therefore be interesting to compare this performance with the curves for "A" and "B." Curves "A" on Fig. 4 are for the 1250 hp adjustable vane pumps for Pearl Harbor and curve "B" corresponds to the same pumps using 1500 hp motors for Hunters Point. Curve "C" is for the same diameter impeller but with the vanes fixed at a 12° angle. It will be seen that this pump has the same capacity at 55 ft. head as does the adjustable vane pump "B" but that at 15 ft. head its discharge is only 111,000 gpm whereas the adjustable vane pump can handle 172,000 gpm. The reason for this is evident from the power curves. The adjustable vane pump utilizes the full 1500 hp over its entire range of operation whereas the fixed vane pump can only absorb about 800 hp at the low head. With this diameter of fixed vane pump at 600 rpm a substantially longer unwatering time would be required. To obtain the required rate would necessitate the use of a larger impeller, a more powerful motor and a slower speed. The motor would only be used at its full capacity at the highest head. A mixed flow type of pump used for such service can be designed to use almost constant power input over this range but would operate at about 300 rpm and would not have the range of discharge as does the adjustable vane pump.

Near the end of the pumping period neither the fixed vane impeller nor the mixed flow pump can control the discharges as readily as can the adjustable vane type. The fixed vane type would have to be shut down one at a time as the depth reaches a level where the water flowing down the dock can no longer keep up with the pump discharge. Eventually the point is reached where the capacity of one pump is too great and the final volume must be removed by small capacity drainage pumps. The adjustable vane pump can control the flow until the floor of the dock is practically dry.

The maximum head on the installations described is 55 feet, the speed 600 rpm, and the discharge 84,000 to 172,000 gpm for the entire range of head for the Drydock at Hunters Point. Were it not for the adjustable vane features the shut-off head of such a pump would be as high as 165 feet and the torque against a closed valve more than double the full load torque of the motor. Relays are installed which will prevent the pump motor being started unless the impeller vanes are feathered. Under this condition the maximum head which can be produced is 37 feet and the torque required by the pump 2900 ft. lbs. This head is less than the maximum operating pressure and is therefore safe. The torque is only 22 per cent of the normal full load value for the motor.

Because of the low pull in torque required, synchronous motors were used with a very substantial saving in cost. In fact this saving together with the higher speed made the overall cost of the adjustable vane pumps and motors less than that of competing mixed flow or fixed vane axial flow pumps. The current characteristics for both docks were 2300 volts, 3 phase, 60 cycle.

Figs. 5 and 6 are the general arrangement drawings of the three 1500 hp units for Hunters Point Drydock No. 4. For reasons of simplicity, a flaring suction bell of cast iron was used, rather than the elbow type of intake. The impeller has four vanes.

The vane pitch is changed by axial motion of the operating rod in the shaft, which transmits the required force to levers on the vane shanks, through links. This mechanism is contained in the impeller hub, and is immersed in oil for lubrication. Force to move the vanes is applied to the draw rod by an oil operated servo-motor in the pump shaft. Oil is admitted through two co-axial pipes through the motor shaft, the center pipe connecting to the area below the piston, and the outer one to the space above the piston. The flow of oil is regulated by means of a vane control valve which is located on top of the motor. The position of the control valve is determined by a frictional hp motor which in turn is actuated from the main control board in the pump room. Oil to actuate the servo-motor is furnished by a pumping unit which automatically maintains the required pressure.

Above the impeller is located the diffuser section, the purpose of which is twofold. First it collects the water from the impeller, straightens it out and discharges it in an axial direction. Second, the guide vanes act as a support for the lower guide bearing of the pump.

This bearing, and the other two, are babbitt lined. Sufficient fresh water is forced into them to prevent the ingress of foreign material.

The flaring discharge tube is formed in the concrete except for the elbow section, which is of welded steel construction, embedded in concrete.

The shaft is covered with a coat of Bitumastic paint except where it passes through the bearings, where it is protected by a stainless steel sleeve.

To maintain constant power input, an automatic wattmetric control reduces the pitch of the vanes as the water level in the dock is lowered. The discharge of the dock at Hunters Point is below low tide with a check valve in the line as well as a protective sluice gate, and the pump motors cannot start until the sluice gates are wide open, neither can they be started unless the impeller vanes are feathered. These conditions being satisfied, operation of the motor switch will start the motor, accelerate and synchronize it. The next step is to open the vanes by a manual control switch to a position corresponding to about 10 per cent capacity of the pump. This switch is then thrown over to the automatic position and the unit passes to control by the wattmetric device, which increases the vane angle by energizing the opening circuit of the vane control motor until the vanes have reached their proper position. As the water is pumped from the dock the head increases, which would naturally increase the power required by the pump if the vane pitch remained unchanged. The wattmetric control compensates for this by decreasing the vane angle to maintain a constant motor load regardless of the head on the pump, until the water approaches about two feet in depth in the dock. At this point, the vanes are automatically removed from wattmetric control and brought to a flat position. They are then controlled manually until all of the water is removed from the dock.

Both docks have been in use for several years. With no ship in the Hunters Point Drydock the unwatering time

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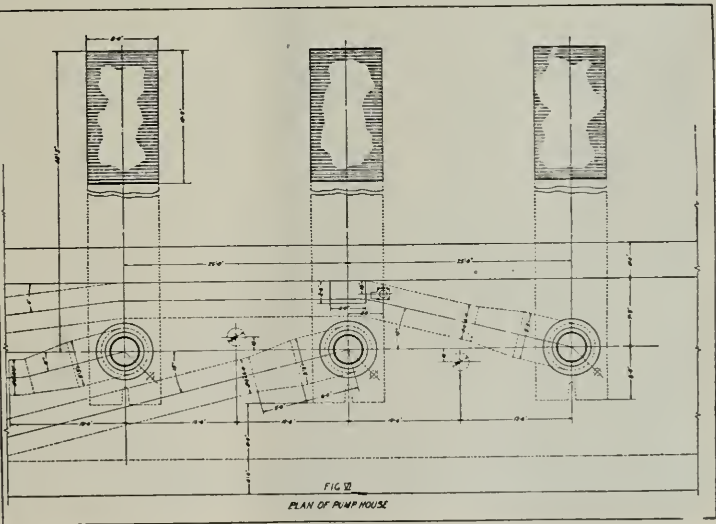
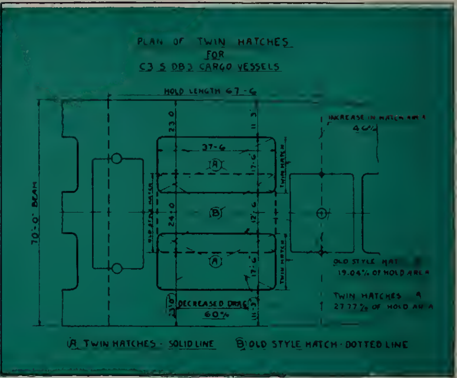


Fig. 6.
Plan of Pump house.

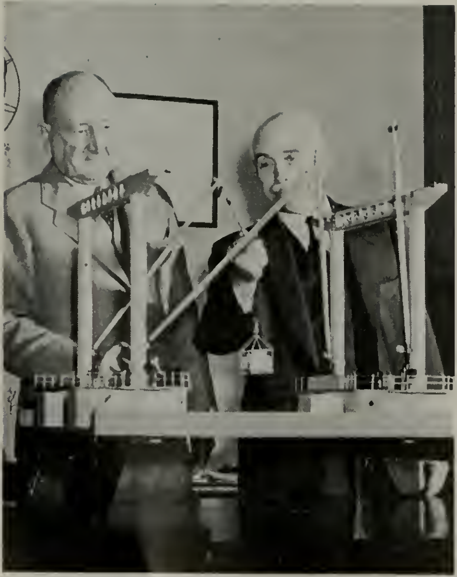
The Proposed C-3



RE-DESIGN OF ITS STANDARD C3 cargo ship for increased speed, carrying capacity and economy of operation is announced by the United States Maritime Commission as a step in its plans to improve the competitive position of the American Merchant Mairne in postwar international trade.

Plans and specifications have been completed, and invitations for bids will be issued upon receipt of applications from shipping lines for purchase of the new model.

Vice Admiral W. W. Smith, USN, (Retired), chairman of the U. S Maritime Commission, is being shown the important feature by use of topping winches, requiring only a single vang for each boom. James L. Bates, managing director, Technical Department of the Maritime Commission is explaining decreased time required for set-up and the labor saved incident to rigging for cargo handling.



The new design, designated C3-S-DB3, will have more horsepower, and a speed of about 18¾ knots compared to the 16½ knots of the present C3. It will also feature re-arrangement of the hull structure and cargo gear for more economical handling and stowage of cargo. Six holds will be provided instead of five as in the present design, and the midship holds will have twin hatches side by side for quicker and easier placement of cargo.

Basically the new design is the same as the present C3 as to cargo capacity and stowage, the Commission explained. The standard "C" ships were all designed as shelter deck type and the new C3-S-DB3 conforms to this practice, meeting the high standards for subdivision that has featured Maritime Commission vessels. Its scantlings and structural design will, however, permit utilization as a full scantling type vessel, thereby obtaining minimum freeboard and maximum draft under load line requirements, and a consequent increase of cargo deadweight of about 1900 tons.

Provision of the sixth hold permits equalization of cargo cubic per unit of cargo handling gear, it was explained. With the additional length of the vessel it has been possible to maintain an adequate length of holds. The twin hatches of the midship holds will reduce cargo handling time by permitting more direct placement of loads in proper stowage space. This is accomplished partly by an increase of 50 per cent of area of holds and 'tween decks directly open for loading, and by great reduction of distance over which cargo must be dragged for stowage at the sides.

Operating experience with C3's especially during the war, greatly influenced modification of cargo gear design for greater efficiency in breaking out booms, setting them in position, burtoning and returning the gear to stowed position on completion of cargo handling. The principal feature of the newly designed gear is the use of a double topping lift arrangement and topping lift winches. This arrangement requires only a single vang for each boom, which decreases the time required for set-up and the labor incident to rigging for cargo handling.

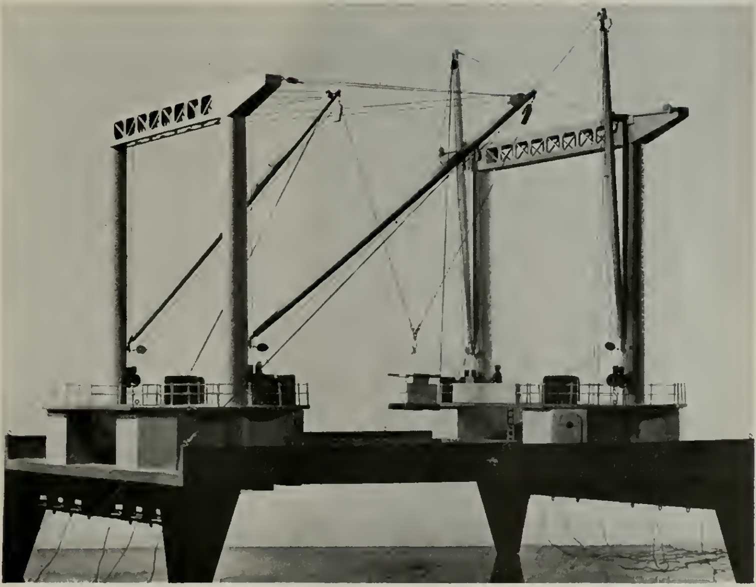
In general appearance the C3-S-DB3 will be the same as the present C3. She will also carry 12 passengers, as does the present design.

Comparative specifications of the modified and present design follow:

	C3-S-DB3	C3
Length between perpendiculars	489′ 0″	465′ 0″
Beam	70′ 0″	69′ 6″
Draft, designed (shelter deck)	29′ 6″	28′ 6″
Draft, maximum (full scantling)	32′ 0″	--*
Depth, molded	45′ 0″	42′ 6″
Normal horsepower	12,500	8,500
Bale capacity	730,000 cu. ft.	725,000 cu. ft.
Estimated cargo deadweight, Full bunkers (shelter deck)	10,000 tons	10,000 tons
Estimated cargo deadweight, Full bunkers (full scantling)	11,900 tons	--*
Shelter deck type:		
Gross tonnage	8,000 est.	7,800
Net tonnage	4,800 est.	4,600
Full scantling type:		
Gross tonnage	10,000 est.	--*
Net tonnage	6,500 est.	--*

*Full scantling figures do not apply to the C3.

Cargo gear on present C-3 type. Simplified gear on proposed vessel is shown on other cuts herewith.



This model illustrates the improved cargo handling gear with which the U. S. Maritime Commission's new C3-S-DB3 vessel will be equipped. Operating experience with C3's, especially during the war, influenced modification of cargo gear design in this new C-type, with the aim of greater efficiency in breaking out booms, setting them in position, burtoning and returning the gear to stowage position.

U. S. Maritime Commission photo

Accident Prevention in Pacific Coast Marine Operations

By JOSEPH H. TRAVERS

ORGANIZED ACCIDENT PREVENTION WORK in the Pacific Coast Marine Industry has come of age. This month, the Accident Prevention Bureau of the Waterfront Employers Association of the Pacific Coast starts on its 21st year of activity. The accident prevention program of this industry is outstanding in the United States. Not only because it embraces the entire industry, but also because of the scope of the program. So far as is known, the Pacific Coast Waterfront Employers are the only group whose Association program provides an inspection and consultation service of trained safety engineers who are available to the individual companies for help in solving their problems. Associations in other industries have confined their efforts to furnishing their members with such help as safety posters and statistical material.


Joseph H. Travers, manager Accident Prevention Bureau, Waterfront Employers Association of the Pacific Coast.

On-shore Stevedoring Trophy presented by Pacific Marine Review to winner, Portland Stevedoring Company.

Admittedly, mounting insurance costs through the middle and late twenties provided the incentive which prompted the leaders of the Pacific Coast Marine Industry to make some effort to curb the number of accidents which were occurring in the longshore industry. They realized that, to be effective, their efforts must be organized on an industry-wide basis and in February 1927 under the sponsorship of the Pacific American Steamship Association, the Shipowners Association of the Pacific Coast and the Waterfront Employers Union, the Accident Prevention Bureau was established in San Francisco as the agency which would head up the work.

In 1929 Columbia River and Los Angeles joined in the movement. In 1936, Seattle, which first started accident prevention work in 1924, joined in, thus making the movement coastwide in scope.

The program which the Accident Prevention Bureau offers to employers is designed to aid in the continued reduction of accidents by improving the working places, We are very glad to present this article outlining the history and present position of the work of organized Accident Prevention carried on for the past 21 years by the Marine Industry of the Pacific Coast.

Pacific Marine Review has been prominently identified with this work since its inception and has through the efforts of its editorial staff and its publication of preliminary safety codes, contributed largely to the success of the effort.

The safety codes issued under the aegis of the Accident Prevention Bureau were pioneer codes for the American Marine Industry. They were worked out by industry-wide committees representing all phases of the industry and all classes concerned. These codes became practical working models for codes evolved on the Atlantic Coast and in foreign countries, and they form an everlasting monument to the farsighted safety statesmanship of the late Byron Pickard, who for 20 years and up to the day preceding his death, was the active head of the Accident Prevention Bureau.

correcting the unsafe methods used and eliminating the unsafe practices of the men. The success of the program depends on the hard work and cooperation of all concerned. Management must continue to accept its responsibilities for providing safe working places and safe methods of operations. Labor must do its share by educating its men to work safely and to correct their unsafe habits.

Services which the Bureau offers can be segregated into four phases:

1. Statistical, including the investigation of accidents and analysis of accident reports. By means of statistical studies, a picture is obtained of the progress which is being made. Accidents are investigated strictly from an accident prevention viewpoint,—"What can be learned from this accident that will aid in preventing another one like it?" The accidents are not investigated from an injury-claim standpoint nor are the results of the investigation turned over to the claims departments. The Bureau's concern is solely with the prevention of accidents and the results of their investigations are made available to the operating department in the form of recommendations.

2. INSPECTIONS. The Bureau's supervisors are constantly inspecting stevedoring operations both afloat and ashore. Unsafe gear, accident-producing conditions of working places such as poor housekeeping, improperly covered hatches, ladders and gangplanks in poor condition, or improperly rigged, are sought out and if found, brought to the attention of the ship's officers or stevedoring company representatives, or both. The Accident Prevention Supervisor cannot correct the conditions he finds. He cannot require that they be corrected. All he can do, and all he should do, is report them to those in charge of operations, for safety is and must remain a part of operations.

Thus far, only physical conditions have been discussed.

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This picture shows the presentation of Off-shore Trophy being made by A. M. Schoenfeldt, District Manager, Employers Mutual Liability Insurance Company of Wisconsin. On-shore Stevedoring Trophy, presented by Pacific Marine Review, won by same company (Portland Stevedoring Company) has just been awarded and is being held by Carl Olsen. People shown in picture are: Ralph Kernan, walking boss; Carl Olsen, superintendent (holding trophy); Rufus Dinwiddie, Portland representative of Employers Mutual Liability Insurance Company of Wisconsin; Dwight Morris, Manager, Portland Stevedoring Company; Robert Belmont, walking boss; and A. M. Schoenfeldt representing the sponsor of the Off-shore Trophy.

Mineral Fiber Insulations and Textiles for Marine Service

By GAYLE B. DUTTON of Western Fiberglas Supply, Ltd.

MINERAL FIBER INSULATIONS AND TEXTILES, consisting of rock wool and glass wool insulating blankets or shapes, and asbestos fiber or glass fiber textiles or combination asbestos glass textiles, have within the past ten years increased their importance many fold to the naval architect.

Prior to preparations in the late thirties to augment this country's battle fleet and to sharply increase our merchant tonnage, textiles of asbestos fiber were the only group of the subject products which possessed any real history in marine usage. These products, consisting of cloths with asbestos contents ranging from 80 per cent to 95 per cent, and with weights per square yard ranging from 20 oz. to 40 oz., were used primarily as fireproof lagging over insulation in boiler and fire room spaces.

(Paper presented to the Northern California Section of The Society of Naval Architects and Marine Engineers)

With the increased naval building activity, the demand for items of the subject group of products became very great. There were five principal reasons for their specification: (1) increased production of these materials was available or was made available, (2) the lightness in weight of these materials was desirable, (3) the lifetime thermal efficiency of the products was excellent, (4) the fire rating of the products was "Incombustible," (5) construction and repair man-hours were saved with these materials.

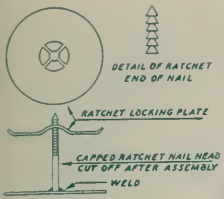
To evaluate the worth of the present end uses of these materials, it is best to examine the individual requirements which arose for their use.

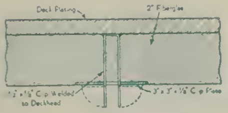
Quarters Insulation

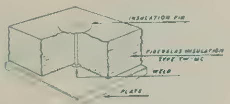
One of the first major end uses of these products which displaced previously specified materials was as insulation for refrigerated spaces and about quarters and machinery spaces. In 1938 naval architects for private steamship companies were specifying the use of mineral or glass wool bats as reefer insulation primarily for reasons 2 through 5 above. Likewise the United States Navy had specified the use of glass wool as quarters insulation on horizontal surfaces and as refrigerated space insulation on some types of fighting ships.

Products of the type mentioned last above which were available for Maritime Commission use included fibrous glass bats without binder and fibrous glass and mineral wool bats with resinous or asphaltic type binders. There products were already available commercially and were adapted easily to marine requirements. The use of these bats as quarters, galley, or machinery space insulation

Applying asphalt as a vapor barrier on the bulkhead separating the hold and the combined galley and forecastle. The Fiberglas insulation, already in place, is concealed by the vapor barrier which is nailed to the studs, leaving about 2 inches of air space between the insulation and the vapor barrier. Two-inch planking will be nailed to the studs, over the vapor barrier.







Above is the ratchet nail method of assembly, using Fiberglas Insulation, Type TW-MC.

To the right is shown the stud weld method, the fastest and most widely accepted method of attaching Fiberglas Insulation, Type TW-MC.

Typical "hair-pin" clip made of strap iron used to attach Fiberglas Insulation, Type TW-MC, to plating.

where a metal shearhing is used as finish has varied little since their introduction.

Products for this same type for U. S. Navy use have been modified. The use of some products for refrigerated spaces at such installed densities as 1½ lbs. per cubic foot has been changed to densities of 3 lbs. per cubic foot for better efficiency for the temperature differential obtaining.

For Navy requirements for hull insulation, a number of factors brought about a radical change in the type of insulation to be used. Shortages of aluminum, plus shortages in manpower for installing metal sheathing demanded consideration of a more rigid material with an integral non-metallic, fireproof finish. To meet these requirements, which were multiplied many fold from a quantity angle after disastrous post - engagement fires caused corkboard to be elminated from combat craft, a rigid board of bonded fibrous glass with a fine weave glass cloth facing one side was developed. This material was designed for application by cement to the ship's plates, and for finishing the exposed surface with glass tape over joints. Later, ship production schedules as well as service records brought about an application method using stud-welded pins and studs.

Sound Absorption

Other uses for mineral fiber blankets have included those in connection with sound absorption. The high sound absorbing or attenuating qualities of these products (especially efficient for sounds of low frequency) have caused their adoption in such places as machinery space intercommunication booths, sound detection rooms, radar rooms, control center rooms, and as liners in the ventilating ducts aboard ship.

Reasons, 2 through 5 listed above, again were responsible for the increased use of mineral fiber sheets and blankets as thermal insulation on ventilating ducts. Large sheets, light in weight, and possessing high insulating efficiency so minimum thicknesses could be used, were well received.

The increased use of high pressure steam, and the resulting large quantities of flanged fittings to insulate, demanded prefabricated removable flanged fitting covers. Through the use of a felted fibrous amosite asbestos mat, these covers were made with speed and possessed excellent service efficiency. This felted mat also was valuable as a filler for insulating blankets about turbine casings, pumps, and other irregular objects.

Mineral fiber textiles proved to be of tremendous aid to many phases of ship construction and operation.

Naval Uses

For those fighting ships where weight was of first importance, light weight textiles were first accepted. In some cases the substitution for lagging cloth of thin fibrous glass cloth over previously used heavier weight cloths, together with the amount of paint saved by reason of non-absorption by the glass fibers, resulted in an estimated saving of six tons in the weight of a cruiser type

Cutting the Fiberglas insulation to fit the space between the studs of the bulkhead separating the hold and the combined galley and forecastle.

vessel. Since these fibrous glass cloths and tapes in 6 to 10 mil thicknesses had breaking strengths in the range 450 to 500 lbs. per inch widths, they could be woven into thin tapes in widths from 2″ to 6″ and used as a spiral lagging about the insulated pipes and fittings. In other cases, the light weight fibrous glass cloth was substituted for asbestos cloth for finish on the insulation about breechings, and over large pieces of heated equipment. It was also substituted as a smoke-pipe cover in some cases.

A completely fireproof gray-colored glass cloth portiere was adapted instead of doors for fighting ships. This material saved weight and was not subject to "jamming." It was also used as porthole curtain material ,and was adapted in some cases for covers over officers' bunks and other flammable furniture.

Electrical Uses

The uses of asbestos and fibrous glass textiles in electrical apparatus aboard ship were many. Fibrous glass cloth coated with vinyl resin compounds was found to be extremely resistant to moisture penetration when used as a membrane in electrical cable splices. In general, the use of fibrous glass textiles as electrical insulation allowed the use of smaller size, lighter equipment to do the work of larger, heavier units, and at the same time failures by reason of moisture or operating temperature conditions were practically eliminated.

Fibrous glass cloth used as a reinforcing medium in a laminated plastic sheet proved of very great service as an electrical panelboard material on shipboard. The combination of Fiberglas cloth and melamine resin was found to result in a board possessing tensile, compressive, and impact strengths over three times as great as linen-base phenolic materials previously used, and also possessing considerably better arc resistance.

Since all of the materials included in this discussion are inorganic in nature and possess diameters running from .00005″ to .00090″, they are of such shapes and weights that once lodged they may remain in position against the skin and cause a sensation similar to that caused by hair down one's neck after a visit to the barber. Although a number of plants producing these fibers have exceptional health records and medical research records show there is no health danger to workers using the fibrous glass textiles or mineral fiber insulation, the psychological attitude toward the material by many workers has necessitated the maintenance of above average fresh air and temperature conditions in spaces aboard ship where these materials are being installed. Also many demands have been made for premium pay for installing these materials. In this latter respect, records kept where large numbers of workers are handling these materials indicate claims much below the average of other crafts.

Application Techniques

At the present time, mineral fiber insulations are installed as quarters insulation in bat form by impaling the sheets over welded studs, or studs attached to the plates by means of cement-bonding to a mesh or screen base attached to the studs. This method can be used by

(Please turn to page 98)

Fitting the Fiberglas insulation between the studs of the bulkhead separating the hold and the combined galley and forecastle.

Frank W. Smith, president of the Society of Port Engineers of San Francisco.

Joseph F. Gisler, a founder and first president, Society of Port Engineers of San Francisco.

J. A. Riemers, secretary-treasurer, Society of Port Engineers of San Francisco.

With the Port Engineers

The editor of the Pacific Marine Review has been notified of the desire of the Society of Port Engineers of San Francisco that the broad coverage of the Marine Industry of the West provided by this publication be made available to the Society, and that its meetings and other activities be reported herein. This we have arranged to do.

THE SOCIETY OF PORT ENGINEERS of San Francisco, which has been holding a series of advance meetings during the past year, was officially organized last month and has filed its articles of incorporation with the Secretary of State at Sacramento.

Most important among the objectives of the Society are the investigation and discussion of problems of the industry, and aid in their solution; and the development of cooperation and friendship among the members.

It is expected that the society will eventually establish and maintain its own club rooms and library.

The first regular election of officers was held at the January meeting with Frank W. Smith, American Mail Line, being chosen president; Louis Deppman, Sudden & Christenson, vice president; and James A. Riemers, States Steamship Company, secretary treasurer. The powers of the corporation will be exercised and controlled by a Board of Governors consisting of twelve members. Elected to be Chairman of the Board is Joseph F. Gisler, Interocean Steamship Company with the following constituting the full Board:

Joseph F. Gisler, Interocean Steamship Company, Harold Wrigley, Weyerhaeuser Steamship Company, A. D. Higgins, American Mail Line, M. C. Wright, Deconhill Shipping Company, Fred Deckard, Marine Transport Lines, M. T. J. Garlinger, Army Transport Service, John Laine, Williams Dimond & Company, Robert Streiff, Coastwise Lines, Ray Sample, Matson Navigation Company, Chester McKay, Pacific Tanker, E. J. Graff, Grace Lines, Robert E. Murphy, J. H. Winchester & Company.

Committee Chairmen for the ensuing year are Joe Gisler, Entertainment & Publicity; Harry Martin, Education; Chester McKay, Program; R. E. Murphy, Welfare.

Among the new members of the society is George Barr of General Electric Company who made the principal address at the first regular program meeting February 4th at the Palace Hotel. His subject was "Care and Upkeep of Steam Turbines." Mr. Barr's address will be fully reported in the March Pacific Marine Review.

Members of Board of Governors of Port Engineers of San Francisco

At left: M. C. Wright, Deconhill Shipping Company; Joe Gisler, chairman, Interocean Steamship Corporation; M. T. J. Garlinger, United States Army Transport Service; and R. H. Sample, Matson Navigation Company.

Below, left: Robert Streiff, Coastwise (Pacific Far East) and United States Line; Ed J. Graff, Grace Line; F. W. Smith, American Mail Line; J. Riemers, Pacific Atlantic Steamship Company; Hugh D. Higgins, American Mail Line; Chester McKay, Pacific Tankers Line; and Robert Murphy, J. H. Winchester & Company.

A Valuable Report On California Ports

Need for additional coastal harbors and inland waterway marinas for light draft vessels in the State, particularly for fishing and recreational craft, is among the findings presented in a report on California ports and harbors just issued by the State Reconstruction and Re-employment Commission.

It was pointed out by A. Earl Washburn, State Director of Reconstruction and Re-employment, that additional harbors for fishing craft are of vital importance to California because a recent survey shows that the Pacific Coast States are producing half of the tonnage and almost half of the total value of fish taken in ocean and inland waters in the United States.

The report recommends that, because of many duplications, inconsistencies and ambiguities in the State Harbor and Navigation Code, a revision commission be designated to clarify and simplify this code.

Other highlights of the report are:

1. The Public Resources Code seems inadequate because no State agency, for example, is given power to prevent one city or county possessing tideland, from building structures which might cause damage to adjoining communities.

2. It is recommended that the State, through a designated agency, actively participate with the U. S. Army Engineers in studies and surveys of the entire coast of the State.

3. It is recommended that the State investigate the desirability of unification of port terminals in California's major harbors similar to the New York Port Authority. It is pointed out that among the advantages of such unification would be:

A. Elimination of needless movement of ships from one terminal to another.

B. Greater efficiency in handling freight and passenger traffic.

C. Less duplication of effort and expense in terminal operations.

D. Pooling of facilities would save new construction unless and until needed.

E. Aid in long-run planning of terminals and highway approaches.

Pacific WORLD TRADE

Reg. U. S. Pat. Off

By T. Douglas MacMullen

The World Trade Center At San Francisco

THE GREAT WORLD TRADE CENTER project to cover from 9 to 20 square blocks in the shipping district of San Francisco, and which has been featured in a number of issues of the Pacific Marine Review during the last several years, is definitely under way. As a construction project it compares with Radio City in New York, and as a means of concentrating the World Trade of the Pacific if not of the entire country in San Francisco, the program will be watched with great interest by shipping people and traders the world around.

After several years of spade work, sparked by Olaf Hansen of Frazar & Hansen, and an earnest group of busi-

Air view of shipping district of San Francisco, with drawing of proposed World Trade Center superimposed in its approximate future location.

ness leaders, the California Legislature last year requested the State Board of Harbor Commissioners to investigate and report at the 1947 session. The Board appointed Dr. Tadeusz B. Spitzer to conduct the survey, and now in a 200 page volume replete with tables, charts and maps the Board reports to the Legislature the result of the investigation. In its judgment such a World Trade Center at San Francisco is both desirable and feasible and in its letter of transmittal submits the following:

1. Desirability

The project is desirable for the reasons that:

(a) It will provide, in a single, readily accessible location, close to San Francisco's harbor facilities, its business and financial districts, a center, in and around which will be concentrated more efficiently and effectively, the activities of those persons, firms and agencies, both private and governmental, whose efforts and functions are concerned primarily with foreign trade.

(b) Such a project will materially facilitate and stimulate trade between the United States and other nations of the world, particularly those nations bordering the Pacific Ocean.

(c) Such a project will contribute, substantially, toward, and will speed, the development of the economy of California and of the entire western area of the United States.

(d) This increased development and foreign trade will inevitably create greater opportunities for employment.

(e) Employment will also be provided for a great many persons in producing and fabricating the materials to be used in the construction of the buildings comprising the center and for an additional large number of persons in the actual construction of the project.

2. Feasibility

(a) The project is feasible for much the same reason that make it desirable.

(b) The many persons with whom the project has been discussed have expressed themselves emphatically that the project is both desirable and feasible. A partial list includes representatives of foreign governments, firms engaged in import and export business, steamship companies, manufacturers engaged or interested in engaging in foreign trade, and a large and diversified list of persons and firms engaged in business or professions serving persons and firms engaged in foreign trade. Virtually all of them have expressed a readiness to make such a center the headquarters of their foreign trade activities.

(c) The project can and should be self-supporting.

It is intended that the material gathered for this report will be analyzed and quoted from time to time in the Pacific Marine Review. One of the chapters (Chapter 9) and two of the tables are given herewith:

FOREIGN TRADE ROUTES SERVED BY SAN FRANCISCO

Some analytical thought should be given to routes served by the San Francisco Port in world trade.

The following table is a tabulation of trade routes, radiating from and agglomerating in San Francisco in 10-year periods from 1900 to 1939.

FOREIGN COMMERCE OF THE SAN FRANCISCO CUSTOMS DISTRICT FROM 1900 TO 1939

By Trade Routes

	Total Exports in 40 years	Per Centage
Northern Europe	$ 283,801,000	6.45%
Scandinavia	84,177,000	1.91
United Kingdom and Ireland	829,530,000	18.87
Mediterranean Basin	24,879,000	.57
West Coast Africa	4,026,000	.09
South Africa	15,543,000	.35
East Coast Africa	3,736,000	.08
Red Sea and Indian Ocean	97,862,000	2.22
Far Eastern Asia	1,865,609,000	42.43
Oceania	592,262,000	13.47
Canada and Labrador	163,645,000	3.72
Central America and Mexico	234,394,000	5.33
West Coast of South America	89,472,000	2.03
Caribbean Sea	68,192,000	1.55
East Coast of South America	28,754,000	.65
Noncontiguous shipments which could not be successfully eliminated—1900 only	12,442,000	.28
TOTAL	4,398,324,000	100.00%

FOREIGN COMMERCE OF THE SAN FRANCISCO CUSTOMS DISTRICT FROM 1900 TO 1939

By Trade Routes

	Total Imports in 40 years	Per Centage
Northern Europe	$ 196,343,000	4.62%
Scandinavia	36,946,000	.87
United Kingdom and Ireland	105,923,000	2.49
Mediterranean Basin	94,451,000	2.22
West Coast Africa	737,000	.02
South Africa	334,000	.01
East Coast Africa	2,265,000	.05
Red Sea and Indian Ocean	400,111,000	9.43
Far Eastern Asia	2,395,651,000	56.40
Oceania	236,276,000	5.56
Canada and Labrador	85,587,000	2.02
Central America and Mexico	321,222,000	7.56
West Coast of South America	83,495,000	1.97
Caribbean Sea	148,240,000	3.49
East Coast of South America	128,572,000	3.03
Noncontiguous shipments which could not be successfully eliminated—1900 only	11,169,000	.26
TOTAL	4,247,322,000	100.00%

Doctor Tadeusz B. Spitzer, who conducted this monumental investigation and prepared the report, is an economist of wide reputation who has specialized in industrial and public works programs in many parts of the world for 30 years. Born in Poland and educated in Poland and Austria, he has owned and operated many large plants in Europe, and since coming to the West Coast, has been working on shipbuilding, railroads, machinery and other industrial developments, as well as on public utility projects. The World Trade Center report is a model of completeness and painstaking accuracy.

Dr. Spitzer is director of research on World Trade Center, Board of State Harbor Commissioners, San Francisco.

A. EXPORTS

The highest or largest ranking customer of San Francisco's foreign trade during the whole 40-year period was Far Eastern Asia, exports to countries of the Far East reaching an average of the total percentage of about 42.5 per cent.

Second largest were the United Kingdom and Ireland, prominent buyers of our vegetable food products, which countries took about 19 per cent of our total export average over the same 40-year period.

Third, comes Oceania with its 40-year total average reaching 13.5 per cent.

Fourth in importance is Northern Europe, rising from 1.82 per cent in the first decade of this century to 11.21 per cent of San Francisco Bay region's total export in the last decade, or during the whole 40-year period the average percentage for Northern Europe being 6.45 per cent. This, in particular, is an important factor and needs to be strongly emphasized so as to prove that the claims, regarding the impossibility for West Coast products to be hauled to Europe, do not agree with the actual facts. An even higher ratio in the exports increase in the 40-year period, and therefore a still more persuasive argument, is to be observed in the rise of San Francisco's exports to Scandinavia from 0.03 per cent in the decade between 1900-1910 to 2.60 per cent in the 1930-1939 decade.

B. IMPORTS

This harbor's imports from the Far East reach an average of well-nigh 56 per cent of its total import. Consequently, we partially finance the whole of the Far East's business with us, and probably with some other countries as well, which is the natural function of highly-industrialized countries in foreign trade and which from the general standpoint is a sound investment of long range.

Strong on the import side of our trade is the region of the Red Sea and Indian Ocean, as in the 40-year average our total imports from that area reached 9.43 per cent.

Next in importance is the area of Central America and Mexico, our imports from these countries totaling an average of 7.56 per cent over the same four decades.

From Oceania our imports totaled only 5.5 per cent, not nearly balancing our exports which totaled an average of 13.5 per cent in the whole 40-year period. Manifestly, Australia buys mainly oil products from us which purchases we cannot offset by any considerable amount of imports from her.

Imports from Northern Europe total only about 70 per cent of San Francisco's exports to that area, but imports from Scandinavia in the last decade come very close to exports (2.17 per cent import and 2.60 per cent export), a very encouraging factor.

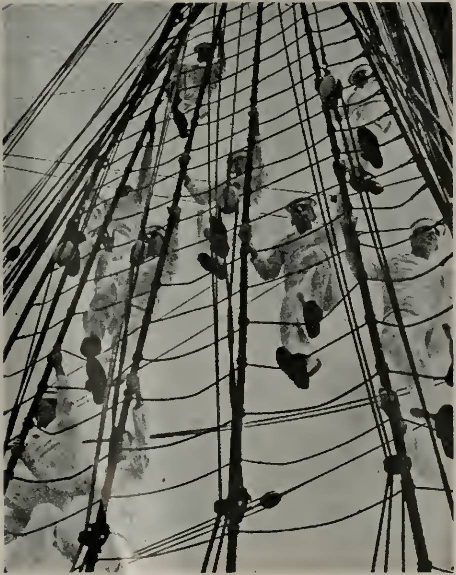
England and Ireland at the present time are not large vendors to the San Francisco Bay region, our imports from them totaling an average of only 2.5 per cent through this harbor during the 40-year period, thus placing these countries in eighth rank in our table.

The foregoing analyses encourage the conclusion that the trade of San Francisco Bay's area with the countries of the Indian Ocean, Central America, Mexico, and in a certain degree Oceania, marks the trend for the future development of both export and import in a balanced increase of our prominent trade with the Far East.

Pacific WORLD TRADE

The Training Ship, Danmark, about to swing into the pier at San Francisco.

Danish Training Ship



The recent arrival in San Francisco of the Danish State Training Ship Danmark, which left Copenhagen in September on its annual training cruise with cadets from the Danish Merchant Marine was commemorated by a series of civic programs sponsored by the Chamber of Commerce, Marine Exchange, United Seamens Service and others. Featured were trips to the Maritime Schools about the bay and visits to Stanford and the University of California. She arrived in San Francisco on January 6, to remain for a period of five days. The Commander is Captain Knud L. Hansen, who is assisted by 10 officers and 6 noncommissioned officers. On board there are 115 cadets who are being trained in practical stemanship and navigation. According to Danish law a seaman's education shall partly take place on board sailing ships, and Danmark is built for this purpose.

When Denmark, on April 9, 1940, was occupied by

A few of the 5000 American cadets who received their training on the training ship Danmark when the vessel was under United States control during the war.

the Germans the Training Ship Danmark was lying in Jacksonville, Florida. The Captain immediately wired to the Danish Minister in Washington, Henrik Kauffmann, that he joined the free Danish movement and did, therefore, not return to Denmark. At the time of the United States' entry into the war he and his crew placed themselves at the disposal of the American Government "in our joint fight for victory and liberty." The ship thereafter was used by the U. S. Coast Guard as a training ship, and during the war not less than 5000 American cadets received their training on board. In these years the ship was stationed in New London, Connecticut, which city will be visited on Danmark's return trip to Denmark. The contribution to the war effort from the ship and its Captain was highly appreciated by the American authorities. In September 1945 Danmark was handed over to the Danish Government.

The three-masted Danmark was built in Nakskov Shipyard, Denmark, in 1933, and has a length of 189 feet. She measures 777 tons gross, and is provided with a 250 horsepower motor.

S. F. World Trade Delegation Meets Danmark

Top row, left: Standing on the pier alongside the Danmark are: John Parker, vice president of Marine Exchange, and president of American Marine Paint Company; M. A. Cremer, manager, Marine Exchange; Henry B. King, president, Junior Chamber of Commerce; Alvin C. Eichholz, manager World Trade Department, San Francisco Chamber of Commerce; Fred B. Galbreath, president, San Francisco Foreign Trade Association and manager Marine Office of America. At right: Colonel S. M. Montesinos, USA, representing the Sixth Army; Fred B. Galbreath, Commander E. J. McDonald, USMS, District Supervisor, U.S. Merchant Marine Cadet Corps, 1000 Geary Street, San Francisco; Captain Malcom E. Crossman, superintendent, U. S. Maritime Service Training Station, Alameda; and Master of the Danmark, Captain Knud L. Hansen.

The bottom row, left: Shipbuilders together! Left to right: T. C. Ingersoll, Bethlehem Steel Co.; Robert E. Christie, United Engineering & Dry Dock Co.; Harvard P. Stewart, Bethlehem Steel Company's San Francisco Yard; and Joseph A. Moore, Jr., president, Moore Dry Dock Company. At right: left to right: Alvin C. Eichholz, Henry B. King, Sporan Fiedler, Danish Consul-General at San Francisco; L. B. Lundborg, general manager, San Francisco Chamber of Commerce; Captain Knud L. Hansen, and William Montgomery, manager Far East American Council, San Francisco.

Pacific WORLD TRADE

Foreign Market is Vital


R. W. Gifford

American firms must allocate a definite share of their production to the foreign market even before domestic needs are filled or "someone else will have the business," says R. W. Gifford, chairman of the board of Borg-Warner International Corp. and vice president of Borg-Warner's Norge Division.

Because "the pent-up demand in the world for our merchandise is beyond belief," Mr. Gifford predicted that America ultimately will reach an export volume of more than 14 billion dollars annually. The new desire abroad for a higher standard of living indicates that our greatest foreign trade will lie in manufactured products, he added, and urged advertisers to make careful analysis of the foreign markets for their products and to study the psychology of their consumers overseas.

"The American advertiser," Mr. Gifford said, "must make foreign customers want his products and want them more than they would that of any foreign producer."

The extent of our foreign trade may determine whether or not the country prospers, Mr. Gifford said, "because in our nation's business just as in private business, it is generally the last 10 or 15 per cent that determines the profit or loss.

"Those who were doing business abroad before the war have just as definite an obligation to their foreign distributors as they have to their domestic distributors. Those who wish to develop these foreign markets for the first time cannot afford to wait until the domestic market is supplied.

"As other countries with lower wages improve their relative industrial efficiency, they will become more difficult competition."

Mr. Gifford found the foreign trade picture shadowed by international bickering.

While "every country in the world is crying for merchandise and raw materials of every kind," Mr. Gifford said, "the world is engaged in the greatest political fight it ever has seen."

England, he observed, is fighting desperately to uphold the world trade influence of the British Empire "while we argue with the Russians." He pointed out that England is withholding all luxuries from her own people in order to regain her trading position abroad through exports.

"England is doing a good job," Mr. Gifford said, "and she has no intention of making concessions that will be to our special benefit. She is now making trade agreements in all parts of the world while we talk about what we hope to do. Other countries also are striving for a place in the foreign trade sun."

Mr. Gifford does not look for Russia itself to be a serious commercial threat outside her own trade sphere for many years, though this sphere is being widened to include much of Eastern Europe.

Expressing the belief that "almost all wars are economic wars," Mr. Gifford added that: "Unless we can find ways and means of solving our international trade problems, and at the same time learn the relationship of trade problems to political problems, we will stand little chance of achieving our goal of a lasting world peace.

"Unfortunately, some departments in the government seem determined to put every possible obstacle in the way of those who wish to do business abroad.

"You will remember that early in the New Deal period, the President almost eliminated the one and only department of our government then devoted to foreign trade because it had been built up by the former President Hoover. I refer to the Foreign and Domestic Commerce Department of the U. S. Department of Commerce. I have only the best to say for this department. They have tried to the best of their ability but with very limited funds. Of Course, during the war everyone had a finger in the pie, and at present the work is divided between the State and Commerce Departments. I am glad to say that considerable effort is being made to rebuild suitable staffs."

The closest cooperation between sales, advertising and service, Mr. Gifford concluded, will enable American

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Pacific American S. S. Assn. Elects And Takes Stand for World Trade

Officers for the Pacific American Steamship Association, oldest trade association comprising the majority of American lines on the Pacific Coast, were elected at the annual meeting in San Francisco, January 30.

President is E. Russell Lutz, executive vice president of the American President Lines.

Executive Director is A. W. Gatov.

Vice Presidents include A. R. Lintner, president, American Mail Lines; H. Lueddemann, vice president, Pope & Talbot, Inc.; R. J. Chandler, vice president, Matson Navigation Company; Donald Watson, manager, Weyerhaeuser Steamship Company; K. C. Tripp, Pacific Coast manager, Moore-McCormack Lines.

Secretary-Treasurer is Henriette T. Smith.

The Association went on record against any broad program of tariff increases such as "shut us out of world markets" following the enactment of the Smoot-Hawley Bill in 1930. Albert W. Gatov, re-elected Executive Director of the group of American lines was authorized to work closely with interested civic and commercial groups now preparing briefs for presentation at State Department hearings in San Francisco on March 10.

The State Department hearings, being held simultaneously in six major cities, are for the purpose of receiving public opinion on the highly controversial tariff question and other trade matters. Following these hearings, American delegates to the International Trade Organization (ITO) meeting at Geneva, Switzerland, in April will negotiate with 17 other countries for the general lowering of world import duties, and removal of the other trade barriers.

But for Amarican delegates to have authority in Geneva, the 80th Congress must leave undisturbed the present Reciprocal Trade Agreement Act. This Federal Law, first enacted in 1934 and renewed in 1945, passes to the President the power to lower American import duties on foreign made products. While it is now on the books to June 1, 1948, several bills have been introduced in the 80th Congress to restrict or eliminate the Chief Executive's tariff adjusting powers.

In adopting a world trade promotion policy, the Association recognized that a thorough study by the State Department will show the need for guarding against drastic tariff reductions which might be ruinous to American economy. "We support the general philosophy of freer world trade," Gatov said, "as an essential to our domestic prosperity in the years to come. If we raise our duties across the board, we'll get the same treatment from the rest of the world. This was our experience in the Smoot-Hawley days, when 71 countries shut us out of their markets.

"Based on normal prewar figures, 10 per cent of American industrial and agricultural products are exported and such exports for many businesses mean the difference between profit and loss. Exports alone will create two million jobs in the United States, and port cities have an even greater stake in world trade."

LINKING THE PAST WITH THE PRESENT

The newly acquired Swedish consulate-general in San Francisco, the former Matson mansion. A coincidence of note: Captain William Matson was the first Swedish consul in San Francisco.

Key Figures for China's Reconstruction

	CONDITION BEFORE OR DURING THE WAR	EXISTING CONDITION	GOAL SET FOR FIVE-YEAR INDUSTRIALIZATION PLAN
(1) Railway Mileage	China Proper 6,400 miles; Northeastern China 6,500 miles	Needs restoration & rehabilitation	10,000 additional miles to be built
(2) Shipping Tonnage	500,000 tons	50,000 tons	1,500,000 tons to be added
(3) Coal Production	Free China 60,000,000 tons; North China 30,000,000 tons; Northeastern China 30,000,000 tons	Equipment in Northeastern China removed abroad; production greatly reduced	Production to be restored to 30,000,000 tons in Northeastern China, and increased to 50,000,000 tons in China Proper
(4) Steel Production	North & Northeastern China 3,000,000 tons; Free China 50,000 tons	Equipment in Northeastern China removed abroad; production of 1,000,000 tons can be rehabilitated	Production to be restored to 2,100,000 tons in Northeastern China, and increased to 900,000 tons in China Proper. Total addition to be 2,000,000 tons per year
(5) Electric Power	China Proper 1,000,000 kw.; Northeastern China 2,000,000 kw.	Equipment in Northeastern China removed abroad; capacity reduced to 25%	Plant capacity to be restored in Northeastern China. Plant capacity of 2,500,000 kw. to be built in China Proper
(6) Export Minerals Production	Tungsten ore 13,000 tons; tin 11,000 tons; antimony 13,000 tons; mercury 100 tons	Equipment badly deteriorated; production greatly reduced	Equipment to be modernized; production to be increased to: Tungsten ore ..... 15,000 tons Tin ..... 14,000 tons Antimony ..... 15,000 tons Mercury ..... 500 tons
(7) Key Manufacturing Industries Production	Negligibly small		Total annual production value estimated at US$450,000,000. Some figures as follows: Steam engine ..... 150,000 h.p. Internal combustion engine ..... 150,000 h.p. Tool machines ..... 31,000 units Steam turbo-generators & water-wheel generators ..... 400,000 kw. Electric motors ..... 750,000 h.p. Transformers ..... 1,200,000 Kva Telephone sets ..... 170,000 sets Radio receivers ..... 300,000 sets Copper wire ..... 15,000 tons Fertilizers ..... 500,000 tons
(8) Cotton Mills		3,500,000 spindles	3,000,000 additional spindles to be installed
(9) Technicians	30,000	30,000	92,000
(10) Skilled Workmen	200,000	200,000	550,000

London Letter

By Our British Marine Insurance Correspondent

Pilferage

THE FACT THAT, in the United States of America, the theft and pilferage bureau has been revived, has been noted here with interest, as the theft and pilferage evil continues to be a real one. Pilferage from the Liverpool Docks, for example, has come under discussion at a meeting of the Liverpool Chamber of Commerce. J. H. Brooks, chairman of the Canned Goods Trade Section, read the following extracts from a letter written by R. J. Hodges, general manager and secretary of the Mersey Docks and Harbor Board:

"The pilferage situation is still unsatisfactory and every effort is being made towards improvement. A series of meetings has taken place with representatives of the Liverpool Steam Ship Owners' Association, the Liverpool Master Porters' and Master Stevedores' Association, the police and the Food Ministry.

"The general question of the necessity for an improvement being effected has been impressed on all parties. In addition, the matter has been brought to the attention of the Transport and General Workers' Union through the Dock Labour Joint Committee, and I am sure that the unions are taking a very serious view of the matter and are prepared to do whatever they can to help. They are dealing with it through their various branch committees so that the men themselves will be reached and the serious reactions on the port as a whole as the result of the continuance of dock thieving made clear to them.

"Apart from this, the board have also taken the matter up with the Mersey Shiprepairers' Federation and the Liverpool Carr and Motor Owners' Association, as covering two important sections of labour on the docks, asking them for their co-operation. The board also intends to discuss the position with the representatives of the appropriate Trade Unions so that both sides of these bodies will be aware of the importance of the position being improved. The board have also detailed an official to investigate this question and he has been given the widest terms of reference. He has already made contact with the various parties connected with the handling of cargo, and his independent reports are being considered not only by the board but also by the Liverpool Master Porters' and Master Stevedores' Association, and the police, to whom copies are being sent.

"It is not the Board's intention to relax the efforts being made, though the primary responsibility for protection against loss and damage rests, of course, with the master porters, and they are being encouraged in their efforts to combat this position. The board themselves are doing everything possible to improve the conditions of the dock sheds, many of which are in a damaged state, but here there are unfortunately restrictive limitations which make rapid progress impossible."

The foregoing illustrates the active steps which are being taken in the Liverpool area to combat what is, in effect, a worldwide evil in this untidy postwar world.

British Government Enters Fire Prevention Activity

Considerable interest is being taken in the formation in Britain of a new Fire Research Organization by the Government, through the Department of Scientific and Industrial Research (D.S.I.R.), jointly with the Fire Offices Committee. The board is fully representative of insurance companies and makers of fire-fighting appliances, etc., and a well-known Lloyd's Register of Shipping personality (Dr. S. F. Dorey) is also on the board. The board is regarded as a very strong one, containing as it does representatives from all the interests involved. Dr. Dorey's inclusion is taken to mean that fire on shipboard will have the consideration it deserves.

Any step to reduce losses by fire will naturally have the wholehearted support of the marine insurance market, as such losses in the past have been both numerous and disastrous. While the Fire Offices Committee are very well represented on the new Board—as indeed, they should be—there is surprise, in view of the importance of this subject to their industry, that there are no comparable representatives from the *marine* insurance compaines or from Lloyd's, (i.e., Lloyd's of London, the group of underwriters). As, however, the Board is still in its first stages, it is more than likely that steps will be taken to take evidence from those who have the knowledge, so that the views of the marine insurance market may receive full attention.

The Fire Research Organization is something entirely new in relations between Government and industry. It is a joint organization, in which an industry and the Government are partners. The cost is shared equally between them. The organization will be responsible for the conduct of research on all aspects of the prevention and extinction of fires, on the safety of life in fires and the mitigation of damage, except that, on the fire resistance of buildings, the organization will collaborate with the Buildings Research organization of D.S.I.R., where much research on this subject has already been done. A fire research station will be jointly established. The capital cost is likely to be of the order of £75,000 to £100,000, and the ultimate annual cost running up to £50,000, both shared equally between the D.S.I.R. and the Fire Offices Committee. As part of their contribution to the capital cost, the F.O.C. will transfer their fire testing station at Elstree to the Government.

The board subjects on which research will be undertaken are: (1) Research on fire prevention, i. e., research on methods of preventing the occurrence of fires. (2) Research on fire fighting, i. e., research on methods of extinguishing fires and on equipment. (3) Research on fire protection of buildings, i. e., on the fire resistance of buildings, properties of building materials and elements of structure, safety of life in fires, e. g., means of escape, the prevention of the spread of fire within buildings and from building to building. (4) Research on other fire hazards, e. g., ships, aircraft, special industrial hazards.

Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

Duty on Ship Repairs in Foreign Ports

IT HAS BEEN SUGGESTED that many of the regular readers of the Pacific Marine Review are interested in some of the unusual statutes and decisions that exist under the customs law of the United States. From time to time I will brief the important decisions that hold particular appeal to the shipping industry.

Many know, and probably an equal number do not, that the Federal Statute, 19 U.S.C.A. 257, requires that the customs officers of the United States collect a duty on equipment or repair parts for vessels made in a foreign country upon a vessel documented under the laws of the United States. The Statute provides as follows:

> "The equipments, or any part thereof, including boats, purchased for, or the repair parts or materials to be used, or the expenses of repairs made in a foreign country upon a vessel documented under the laws of the United States to engage in the foreign or coasting trade, or a vessel intended to be employed in such trade, shall, on the first arrival of such vessel in any port of the United States, be liable to entry and the payment of an ad volorem duty of 50 per centum on the cost thereof in such foreign country; and if the owner or master of such vessel shall willfully and knowingly neglect or fail to report, make entry, and pay duties as herein required, such vessel, with her tackle, apparel, and furniture, shall be seized and forfeited. For the purposes of this section, compensation paid to members of the regular crew of such vessel in connection with the installation of any such equipments or any part thereof, or the making of repairs, in a foreign country, shall not be included in the cost of such equipment or part thereof, or of such repairs."

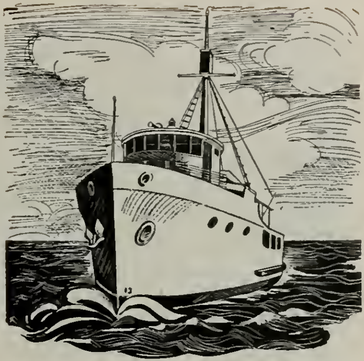
In *United States vs. Admiral Oriental Line,* 18 C.C.P.A. 137, the court held that equipment for a vessel is ordinarily limited to portable things while the hull and fittings constitute things of permanent character and, therefore, the permanent installation of a steel swimming tank, which necessarily becomes attached to the hull of an American registered vessel while in a foreign port, is not equipment nor repair and, therefore, the cost of installation is not dutiable as such. The reason for the rule or the theory behind the statute is certainly obvious. Cheaper labor and cheaper materials provided by foreign countries in their ports of repair would give the American shipowner a decided advantage if he were able to arrange and schedule repairs and the furnishing of new equipment at foreign ports instead of the vessel's home port or other American ports. The duty is equal to 50 per cent of the cost of repair or equipment which again is theoretically equivalent to the difference between the actual cost of the repairs or equipment if completed at American ports or with American labor and material.

Many cases have attempted to define the meaning of the word "repairs" as it is used in the aforesaid statute. In *E. E. Kelly & Company vs. U. S.,* the court held that repairs in a foreign country within the statute include "maintenance painting". In *American Mail Line vs. U. S.,* 50 per cent ad valorem duty was held to be properly assessed under the act on the expenses of certain painting done in a foreign port, in part on the exterior and in part on the interior of the ship by a foreign contractor, the paint itself being purchased in the United States.

While fuel and ship's stores may be retained on board vessels arriving in the United States from foreign ports without payment of duty, a part of a *manifest cargo* of oil pumped into the bunker tanks of the importing vessel after its arrival in the port of entry, not included in the ship's stores list, is not exempt from duty as fuel supplies. *Sinclair Refining Co., etc., vs. U. S.*

19 U.S.C.A. 258 provides an exception to the rule expressed under the duty statute where, if the owner or master of the vessel furnishes sufficient evidence that the vessel during the course of its voyage was compelled by stress of weather or other casualty to put into a foreign port and purchase equipment or make repairs to secure the safety or seaworthiness of the vessel that would in turn permit her to reach her port of destination, or if the equipment or parts thereof or repair parts or the materials were manufactured or produced in the United States and the labor necessary to install the equipment or make the repairs was performed by a resident of the United States or by members of the regular crew of the vessel, then the Secretary of the Treasury may remit or refund the duty.

Coast COMMERCIAL CRAFT

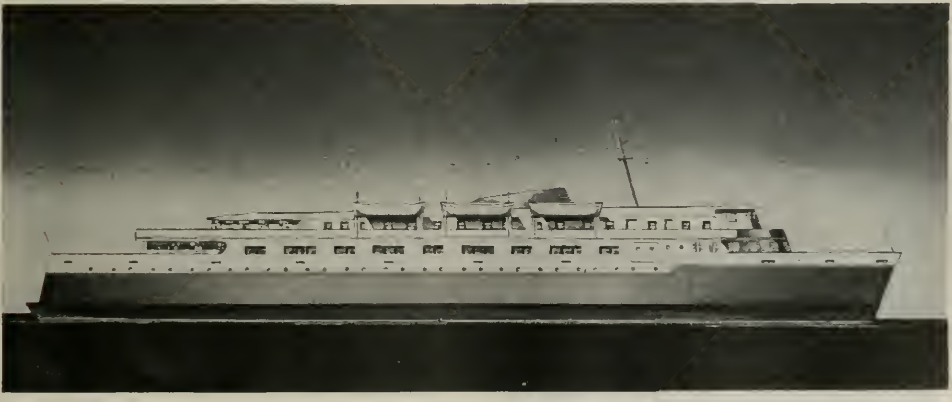


New Speedy Auto-Passenger Liner

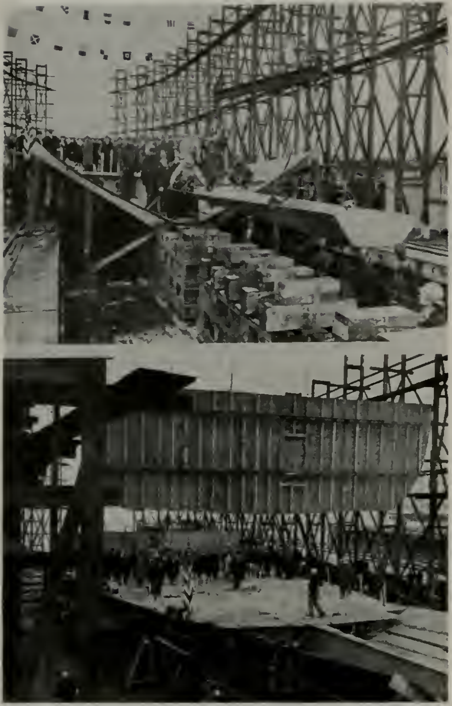
Puget Sound Navigation Company, the largest inland water shipping firm operating on the Pacific Coast, is now demonstrating again the carefully progressive management that has characterized their executives for many years. They have ordered and now have under construction at the Seattle yard of the Todd Shipyards Corporation, a motorship for the Seattle-Port Townsend-Port Angeles-Victoria overnight run that will be the most modern and most lavishly equipped vessel for automobile-passenger service yet built in America.

Designed by the well-known firm of naval architects, Gibbs & Cox, Inc. of New York, she is described by William Francis Gibbs, senior partner of the firm, as "The Queen Elizabeth of the Inland Seas." The table herewith gives her principal characteristics.

Keel for this ship was laid December 17, 1946 at



Artist's sketch of new auto-passenger liner for Puget Sound Navigation Company, Seattle-Victoria run.



Keel-laying for the new steel auto passenger liner, at the Todd Shipyard Corporation Plant A, Seattle, Washington.

Todd's Plant A, Harbor Island, Seattle. She is scheduled for launching April 18 and for delivery June 1.

The steel hull is designed for maximum safety and the arrangement of watertight bulkheads makes her a two compartment hull, "which means that three compartments must be flooded before a sinking condition could occur." All combustible materials used in construction or outfitting are being completely fireproofed. Adequate fire extinguishing systems covering accommodations, machinery spaces, and automobile deck will be installed. The most up-to-date navigation devices, including radar, will be installed on bridge and in pilothouse. Ship-to-shore telephones will be a feature.

Propulsion power is provided by four General Motors diesel engines each rated 1500 shp and each driving a 525 volt electric generator. Each generator is electrically coupled through suitable controls to a 1200 shp electric motor. The motors work in pairs, each pair driving one of the propellar shafts through reduction gears. In ordinary weather this plant will drive the hull easily at 18 knots. For auxiliary power and lights there are installed 2—200 kw diesel engine drive generating sets. Twin rudders are fitted at the stern to give great maneuverability which is much needed on this run, especially in the harbor of Victoria. An unusual color scheme is being used in the engine room. Bulkheads and ceilings are to be aluminum and engines and other machinery are to be white.

Accommodations for passengers will be spacious and luxurious. Large lounges, smoking room and writing room, together with a covered glass-enclosed promenade take up most of the space on the promenade deck. The public rooms are air conditioned and lighted with fluorescent lamps. Dining room facilities are installed on the boat deck aft. The main room seats 100 or more at tables. This room is surrounded by large windows, giving an uninterrupted vista of the natural beauties of Puget Sound and the Straights of Juan De Fuca. A modern electric galley will serve these dining facilities. A coffee shop is installed for short orders.

One hundred and four sleeping rooms are to be installed in three classes,—cabin, de luxe, and super de luxe. Each room is furnished with twin beds so that the sleeping capacity is 208 total. Each room is fitted for air conditioning and is equipped with Combolet lavatories, supplied with hot and cold running fresh water, and cold salt water.

Characteristics

Length O. A.	**312 -2"**
Length W. L.	**300'-0"**
Beam Molded	**53 -0"**
Beam Overall	**62'-6"**
Depth to Main Deck	**20 -0"**
Draft Loaded	**13'-0"**
Auto. Capacity	**100 cars**
Passenger Capacity	**900 persons**
Propulsion	**Two screws**
Propulsion Power	**Total 4800 shp**
Service Speed	**18.5 knots**

A clever arrangement of the automobile or main deck allows high central clearance for very heavily loaded trucks. The engine room trunk is made very narrow with a truck lane on each side. Above these truck lanes is a clerestory running up to the second deck above and giving a net clearance of 16 feet. On each side of this clerestory is a platform deck reducing the clearance to a net of seven feet. Under this clearance, port and starboard, there are two lanes for automobiles. On the platform deck on each side are cabin class bedrooms with a four foot passageway running along the inboard margin giving access to the rooms.

When placed in commission this ship will make daily trips—leaving Seattle every night and arriving at Victoria, with stops at Port Townsend and Port Angeles en route, early the next morning. During the summer she will make a trip to Port Angeles and return in the early

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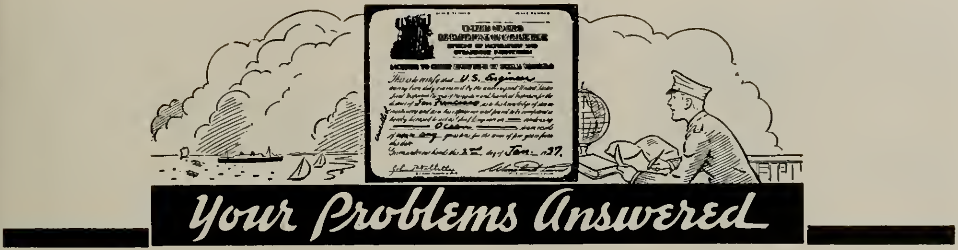


Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

The Marine Boiler

II—Modern Boiler Design

IN OUR FIRST INSTALLMENT OF THIS SERIES on the marine boiler we traced rather sketchily the development of this steam generator down to the famous cylindrical fire-tube boiler, known as "Scotch." The upper pressure limit of this boiler in large sizes is for practical marine purposes approximately 300 psi and most engineers would prefer it to be 225 psi. The more modern type water tube boiler, perfectly adaptable to very much higher pressures, is now available for shore plants in specially designed types up to 3000 psi and has been installed in marine plants up to 1400 psi, and at temperatures up to 900° F.

Since these higher pressures and temperatures offer great inducements in the way of saving in fuel the trend is upward. In America the pressure range of 450-600 with a temperature of 750°-800°F. has become standard for medium powered steam plants of 2,500 to 10,000 shp on one propeller shaft. Well designed boilers in conjunction with double reduction geared turbines running at these temperatures and pressures have produced a shaft horsepower on trials at a fuel consumption rate as low as 0.54 lbs. of oil per hour.

The relative advantages and disadvantages of the "Scotch" fire tube boiler as compared with the water tube boiler have been discussed pro and con in technical literature to such an extend that many volumes can be found devoted to that topic. Briefly Scotch boilers are: easily accessible for maintenance and repairs and are understood by marine mechanics at every port in the world; they are reasonably economical; they can be operated with sea water or impure fresh water; and they do not require any high degree of skill in their operation. Conversely Scotch boilers: are very heavy and bulky due to the large water content; are slow to meet rapid changes in steam demands; are slow to raise steam in starting; are extremely dangerous in the event of explosion; and are subject to tremendous stresses caused by unequal expansion of parts.

Water tube boilers: allow a much more flexible design and are 25 to 50 per cent lighter and 10 to 30 per cent less bulky for a given capacity; have much higher rates of evaporation; have ability to raise steam much more quickly in starting. In a well designed water tube boiler with oil fires steam has been raised to 200 psi in 10 minutes. Usual practice is to take an hour. With large double end Scotch boilers usual practice is to start fires 15 hours ahead of scheduled start of voyage.

In modern, closed feed water cycle, water-tube boiler turbine combinations, the transformation of heat and pressure into dynamic energy is extremely rapid. Steam leaves the boiler at a pressure of say 600 psi gage and at a temperature hot enough to set fire to a stick of dry pine wood and 0.05 of a second later leaves the turbine and drops into the condenser at a temperature too cool for a comfortably warm bath and at a pressure of approximately 0.7 pounds absolute or 28.5 inches Hg vacuum. The modern steam turbine deserves great credit for its economy in turning the energy of the steam into motion. The double reduction gears also deserve great credit for the efficiency with which they transform the very high and economical rotative speed of the turbine into the comparatively very low efficient speed of the screw propeller. However, the design of the boiler and its auxiliary equipment must be such that the necessary steam at the right pressure and temperature may be delivered at the turbine nozzles at a fuel consumption rate within the guarantee for the ship or she will not make her economy record. Therefore it is up to the engineer on watch to see that his boilers and their auxiliaries are functioning properly. If he does this the turbine and the gears will usually take care of themselves barring emergencies.

In the great majority of modern American steamers under 12,000 shp the engine and boiler rooms are combined. This obviously has the advantage of very short steam connections and an overall saving of valuable cargo space. However, to the mind of the writer its chief advantage is in the fact that the engineer on watch can more easily and without getting away from his station keep a watchful eye on boiler performance.

Standard Marine Boiler

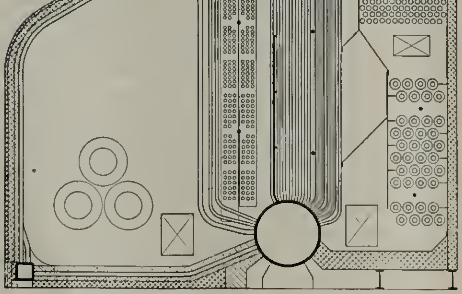
Out of the great shipbuilding program of World War II there emerges a somewhat standardized water tube boiler design for the long range Maritime Commission vessels. This is the D type fitted with economizer, air heater, and superheater and built with water tube furnace walls.

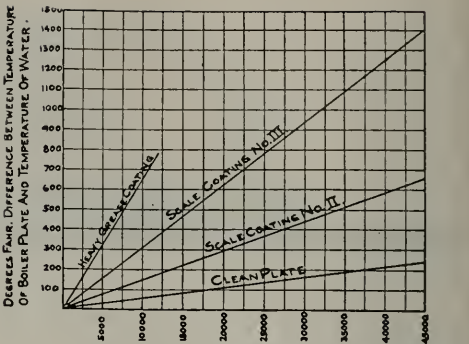
Illustrations show this design as manufactured for the U. S. Maritime Commission by three of the principal marine boiler manufacturers of the United States. For the Liberty type steamer the design shown in Fig. 4 was chosen and nine American manufacturers built these boilers for the Liberty ships that form the bulk of the new American merchant fleet. This boiler design is absolutely standardized and is interchangeable regardless of ship or manufacturer.

For the D design there are numerous small differences between the boilers coming from different factories and also between the boilers specified for different types of ships. In general the D is specified and installed two boilers to each set of turbines and of such capacity that each of the boilers is able to supply steam for the normal rating of the turbine for a considerable period of time, if not continuously. This capacity to handle large overloads is a very valuable characteristic of this type of steam generator.

The care and maintenance of this equipment is very important, and is reflected in the overall performance of the vessel by evidence that is readily recognized by the port engineer and the operating manager. Cleanliness is all important and there are certain fittings built into the boiler and certain instruments supplied by its manufacturer that, if properly used, go a long way toward keeping the boiler clean inside and out.

D-type marine steam generator equipped with superheater, economizer, and air heater.





Effect of scale and rate of driving.

An engineer coming onto the staff of a ship should as promptly as possible get a copy of the instruction book issued by the manufacturer of the boilers installed on that ship. He should thoroughly inform himself about all the details of that boiler and follow carefully the instructions given for starting or putting the boiler in service and for taking it out of service. He should inspect the tools and spares to see that everything needed is there and is in order for use. He should inspect the fittings and equipment of the boiler itself and of the apparatus for feed water and for flue gas analysis.

Many operation engineers do not fully appreciate the importance of keeping the heat transfer surfaces of a boiler clean. As an example take the inner and outer surface of a tube in a water tube boiler. The inner surface is subject to deposits of scale from the feed water. The outer surface is subject to deposits of soot from the products of combustion in the furnace.

Scale

Boiler inspection reports to insurance companies show that more than ½ of all the boiler troubles are due to overheating of metal caused by scale deposits. It is a characteristic of most scale that it becomes more dangerous as the boiler is forced to keep up steam. Since a thin layer of this material will cause a loss of 10 to 12 per cent in steaming capacity, its very presence on the tubes induces forcing of the boiler to maintain the steaming rate. This forcing dries out the scale next to the tube surface and makes it a better insulator and the tube becomes overheated and breaks down. This effect is shown very graphically for various scales in the diagram (Fig. 5) herewith, taken from a publication of the Cochrane Corporation. The coefficients of transmission of heat were

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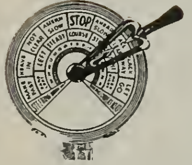
Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

Cockeyed Vessel

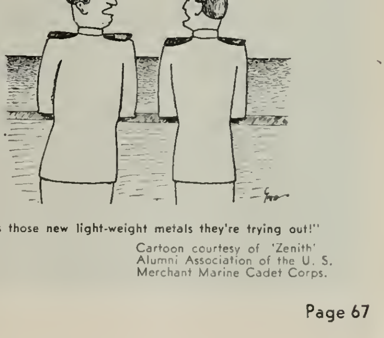
The cartoon illustrating this page and reproduced from "Zenith" the magazine published by the Alumnae Association of the U. S. Merchant Marine Cadet Corps represents two deck officers evidencing their interest in ship development.

Prompted by this drawing we are here presenting some of the strange fancies of inventors with regard to ship hulls and marine propulsion. Inland inventors who know nothing about the sea are bringing out these ideas constantly and it may be assumed without much danger of successful refuration that their ancestors were a nuisance to old Noah while he was building the Ark.

The story is told of Moran, the great New York tug boat operator that, after listening patiently to the long story of such an inventor who had a new revolutionary form of hull, he said, "Thanks my friend for showing me this very interesting model; now all you have to do is to go home and invent a new form of ocean on which this boat will run."

One of the strangest of fancies regarding ships and ship propulsion is the jointed hull. Our illustration of this type of monstrosity is from a drawing in an Illustrated London News issue of the 1850's. The article says that such a vessel was actually built in a Spanish shipyard and had a successful trial trip wherein the inventor proved mathematically that she ran 4 knots faster than a stiff hull of the same dimensions would run with the same power. Of course, in order to do this or show any gain at all she would have to have waves made to order and arranged so that their crests were perpendicular to the line of her desired course, and of the correct distance apart to suit the length of the sections of the hull. This same idea was revived and patented by an American inventor (an engineer and bridge builder of some note) just after the first world war. He added to the joints an interrupted gear arrangement whereby the motion of the joints was changed into continuous rotation of a shaft driving an electric generator that produced electric power to drive a propulsion motor. However, the principal claim of this engineer's patent specifications, described the use of his invention as a floating power plant used to generate electric power for shore purposes. He was forming a nonprofit organization which would rent the right to use this invention off continental coast lines and would use the proceeds to take care of widows and orphans of World War I. So far as we know, nothing was ever done with this one.

Many curious schemes for improving marine transportation were presented to the U. S. Shipping Board during and after the first world war and caused much mental disturbance to that political body. The natural



"It's those new light-weight metals they're trying out!"

Cartoon courtesy of 'Zenith'
Alumni Association of the U. S.
Merchant Marine Cadet Corps.

method by which an inventor in any State approaches the Federal Government is through a congressman from his district. The congressman, if the invention is nautical, naturally refers him to the Shipping Board or, as it is now, the Maritime Commission. The Shipping Board writes him a nice letter letting him down as easy as they can. The would-be inventor complains to the Congressman who, knowing nothing about the merits and caring less, writes a hot letter to the Commission telling them to try this idea out or else. A copy of this letter sent to the inventor keeps the electorate at home keyed up to the belief that their individual problems are well taken care of by their representative in Washington.

Here is a copy of a letter sent to the Shipping Board and illustrative of many such:

Personal and Private

. . . . Esq.,
Chairman, U. S. Shipping Board,
Washington, D. C.

Dear Sir:

As you are now the executive head of the shipping business of the Country, I present to you a plan to better sea transportation. Up to this time I have kept my ideas secret, as I knew the heartless capitalists would rob me of them. But now, Sir, I feel safe in telling you a way by which the tremendous costs of fuel may be eliminated.

If the U. S. Shipping Board takes advantage of this offer of mine, and after the War is over a grateful government should present me with a part of the millions of dollars saved, I shall not have thought and planned in vain.

Briefly, my system is this:—Everyone know the great heat generated by electricity. My invention arranges to pass a current of electricity through the furnaces and tubes of the present boilers of a steamer. This would make steam that would operate the propelling engines as well as a dynamo to generate more electric heat for the boilers. Thus the cycle would repeat itself and we would have a self-propelled vessel, with all fuel costs cut out. As a lack of capital has prevented me perfecting the plan, I present it to you as above stated. Will say that I have never operated either a steam engine or an electric machine, but have read about them both. Of course you will see the simplicity of the idea.

Please advise me promptly as to the date I am to report to you to take charge of the building of the first unit.

Yours very truly,

Sam Scoville.

After every major wreck at sea there are always a flood of patents on such equipment as lifeboats, life rafts, releasing gears, davits, etc., practically all from would-be mechanical experts who may never have seen a ship. Some of the patentable new ideas on deck gear and hull forms should be the object of study by qualified deck officers of the merchant marine. In the past most of the improvements in navigational mathematics and in observing instruments have come through deck officers of the Navy or the merchant marine. Examples are Captain T. H. Sumner, Admiral Marcq St. Hilair, Nathaniel Bowditch, and P. V. H. Weems. Any mathematically or mechanically inclined deck officer can and should think up improvements in the equipment he is using or supervising every day.

Fortunately we have the Bureau of Marine Inspection of the U. S. Coast Guard who must approve all equipment before it can legally be used on an American vessel and license all officers before they can serve under the U. S. flag. So the American Merchant Marine is protected against the crop of would-be inventors and is kept conservative in its engineering safety, and navigational fittings. The wonderful safety record at sea over the years is largely due to the conservative practice of this bureau, formerly the U. S. Steamboat Inspection Service.

Iron Steamer Connector

On the Ways

New Construction — Reconditioning — Repairs

Radar Demonstrated on San Francisco Bay

The first commercial demonstration of radar navigation in the Bay Area was shown to newsmen January 30, by officials and engineers of the General Electric Co. on the Southern Pacific's ferryboat Sacramento.

The electronic navigator, a "packaged unit," designed specifically for maritime service, provides the mariner with an instrument to plot a safe course any time, day or night, even though his normal visibility is strongly limited by darkness, fog or rain.

The navigator consists of two main parts: (1) the rotating antenna which is located on top of the ship's pilothouse; (2) the viewing console on which the radar picture is presented is in the wheelhouse.

The rotating antenna sends out powerful radio micro-waves, capable of penetrating any atmospheric condition such as thick fog, and traveling with the speed of light. These waves bounce off any solid object and scatter, some returning to the antenna during the time intervals between outgoing pulses. Amplified, these "echoes" appear as bright spots on the face of a cathode ray tube which is similar to a television screen tube.

Fixed electronic marker-circles on the face of the screen indicate the distance of objects from the ship. These markers are calibrated in three ranges: two miles for very close work in crowded areas; six miles for coastwise, and 30 miles for open sea. Since the measure of distance to an object is given with extreme accuracy by the marker circles, the system must be able to measure time down to 1/100 millionth of a second.

The radar unit demonstrated on the Sacramento is the same as that for the luxury liners, SS President Cleveland and SS President Wilson. A direct-reading instrument, it is extremely simple to operate and untrained persons can master it readily. It is unaffected by static or interference from the ship's electrical equipment. A 115 volt alternating current is used and power consumption is less than that for an ordinary electric toaster.

General Electric's factory in Syracuse, N. Y., is shipping electronic navigators on a 60 to 90 day delivery basis with manufacture now on a full production schedule.

San Francisco Bay in the "Radar "scope." Dominating the picture is the San Francisco-Oakland Bay bridge. The dot in the exact center is the "Sacramento," which has just passed under the bridge and past Yerba Buena Island, midway between San Francisco and Oakland. Every white speck is obstacle of some kind. The larger ones are ships, the smaller ones buoys or small boats.

The Radar rotating ("whirling eye") antenna on top of the Southern Pacific ferryboat Sacramento. The rotating antenna is analogous to a rotating searchlight in that it sends out radio beams to locate obstacles in the ship's path.

Captain Hans H. Valentine (left), officer in charge of the ferryboat during demonstration run on San Francisco Bay held Thursday morning, January 30, 1947, and Captain Charles F. Heath (right), assistant supt., Western Division, in charge of Southern Pacific's ferryboat operations, look on while Charles T. Haist, Jr. (center), of San Francisco and district representative of the marine division of General Electric's Electronic Department operates the controls.

An old familiar ferryboat, Sierra Nevada, in for repairs at Bethlehem-Alameda Repair Yard. At the right is Bethlehem Steel Company's Alameda Repair Yard, now employs close to 100 men. Left to right: A U. S. Army Transport Service 65-ton derrick barge; two Coast Guard cutters, the Cahoone and Pulaski, being decommissioned; on the 3000-ton floating dry dock, the ATR59, a seagoing tug, hull inspection, painting and voyage repairs; and the Sierra Nevada. Behind the floating drydock can be seen the masts of the North Bend, steam lumber schooner.

Ferry Boat Conversion

Proof that not all of the old railroad passenger ferries, which for many years plied between San Francisco and Oakland, have outlived their usefulness on San Francisco Bay is seen at Bethlehem Steel Company's Alameda Repair Yard. Here the former Edward T. Jeffery, now the SS Sierra Nevada, is being converted to a combination vehicle and passenger ferry for the Richmond-San Rafael Auto Ferries, and will go into service in May, completely renovated with a capacity of 400 passengers and 35 autos, plus a modernized restaurant to seat approximately 40 persons.

The SS Sierra Nevada was built in Oakland in 1913 by the Moore & Scott Iron Works for the Western Pacific R. R. and christened Edward T. Jeffery. She has an overall length of 218 feet, an overhang guard-to-guard beam of 63′ 8″ and a gross tonnage of 1578. She is powered by a Moore & Scott double compound reciprocating engine and has double end screws for four water tube boilers. Her name was afterward changed to Feather River and later, when bought by the Southern Pacific Co., to Sierra Nevada.

During World War II the ferry was taken over by the U. S. Maritime Commission from the Southern Pacific and operated by the U. S. Coast Guard between San Francisco and the Richmond Shipyards. Work now being done includes removing all passenger seats from the lower deck to make room for three lanes of autos; removing the sliding doors at both ends of the vessel for free openings; installing steel racking plates for added support of the deck above; and relocating two life boats and stanchions from the outboard end to saloon deck level. The existing cigar stand and washroom will be removed from the main deck to permit free access by automobiles. Four frames two on each side of main deck, are to be altered to give overhead and lateral clearance for autos and trucks.

She will be drydocked, cleaned, inspected, and painted white from the main deck up to and including the pilothouse. Both tailshafts will be drawn for examination, and two new propellers will be installed. Both rudders will be checked for clearance of gudgeons and pintles.

All main and auxiliary machinery is being inspected, boilers tested, and both fire alarm and fire extinguishing systems will be put in top operating condition.

Richmond-San Rafael Auto Ferry operates steamers every 22 minutes between Richmond and Point San Quentin. With the addition of the SS Sierra Nevada the ferry company will have four steel ferry steamers, which with the new ferry pier extending 1000 feet out into the Bay at Richmond will materially shorten travel time.

Giant Crane at Hunter's Point

The world's largest overhead traveling crane, capable of lifting battleship gun turrets and other huge sections weighing as much as 450 long tons is being erected by U. S. Steel's American Bridge Company in the San Francisco Naval Shipyard at Hunter's Point, California. Completion of the giant lift will make Uncle Sam fastest on the draw among the nations in the replacing of battleship guns.

Swifter repair service for fighting ships also will be made possible by the twin cranes that will operate singly or in tandem atop the bridge type runway 207 feet high. Airway obstruction lights will shine from the top of the structure, which will be accessible by an elevator in one of the four steel towers that are its supports. The structure is designed to resist earthquake shocks and high wind loads. It was fabricated at plants of the American Bridge Company in Ambridge, Pennsylvania, and Gary, Indiana.

The 730-foot runway spans a pier 405 feet wide, extending 162½ feet over the water on each side. The cranes, which have a 142-foot span, thus will run out over the bay, where they can operate their main hooks through a vertical range of 185 feet,

World's largest overhead traveling crane being erected in the San Francisco Naval Shipyard at Hunter's Point.

The Panama Liner Cristobal in dry dock at Todd Shipyards Corporation's Brooklyn Division undergoing final stages of reconversion.

from 25 feet below to 160 feet above water level.

Besides a main hook having a rated capacity of 225 long tons or 250 short tons at a hoisting speed of 10 feet a minute, each crane has an auxiliary hook with a rated capacity of 50 long tons lifted at 30 feet a minute. Loads in excess of 225 long tons will be lifted by coupling the two cranes together. They will then use an equalizer beam which gives them a combined rated hoisting capacity of 450 long tons at 10 feet a minute. Automatic electric switches by lighting red or green lights will indicate whether or not the two separate cranes are lifting in unison.

. A total of 8,400 tons of steel went into the runway structure and cranes, according to E. E. McKeen, project engineer of U. S. Steel's American Bridge Company.

Cristobal Re-enters Panama Run

The 10-000-ton liner Cristobal of the Panama Line after reconversion at Todd Shipyards Corporation's Brooklyn division, has returned to service between New York and the Canal Zone.

She will have accommodations for 202 passengers, all one class, and will be the second of the Panama Line's modern ships to re-enter service, her sister, the Panama having resumed last September.

Every piece of machinery in the entire ship was taken down for overhaul and repair or replacement of parts. This included a total of 290 electric motors 186 of which were placed in the shops, cleaned and balanced and given new bearings and fittings. Hundreds of "custom-made" fittings—even locks—were turned out for the Cristobal by the machine shops in the yard.

Sand-blasting to remove old paint and scale, was used on all external surfaces, from the top of the funnel to the keel. Special tubular steel portable staging, was used throughout the operations.

Some 2,200 troop bunks were re-

A MODERN ARK
This coal barge, with a coal-carrying capacity of 2050 long tons, is one of four, the largest of their type ever built for harbor services. Constructed by Bethlehem Steel Company's Staten Island Yard for the M. & J. Tracy Company. The all-steel craft is 146′ long, 38′ beam and 17′6″ in depth.

THE 50th S. F. BUILT DESTROYER
USS William C. Lawe, 2200 ton vessel built at Bethlehem Steel's San Francisco Yard and recently commissioned.

moved and the cabins and public rooms stripped of their wartime fittings, the "degaussing" system taken out, and 1,100 tons of cobblestone ballast removed.

New protex glass was installed in doors and windows of the public rooms; blackout partitioning and sheating was dismantled; a new club room bar installed; and new magnesite and tile decking laid in many sections of the ship.

The swimming pool on the boat deck, which had been used as an adjunct to the troop quarters, is being restored with new tiling, cement, piping, lighting and mesh safety net.

Ventilating, refrigerating, fire-alarm and telegraph systems were repaired and overhauled. Lifeboats and davits were removed and overhauled, and eight new king posts for cargo-handling, constructed in the yard, were put in the ship. The main engines were opened for inspection and boilers, condensers, turbines and generators were taken down for repairs and renewals, and one of the ship's twenty-ton, forty-two foot tail shafts was replaced.

Anti-corrosive and anti-fouling cold plastic paints were used on the hull, from keel to deep load-line.

American Shipbuilding

The table herewith reproduced from the current issue of "The Bulletin," American Bureau of Shipping shows at a glance the contracts for new construction existing in American Shipyards as of January 1, 1947. It will be noted in the recap at bottom of table that the self propelled craft included a total of 179 with a gross tonnage of 428,150.

A careful study of the contracts included in this table shows that 58 vessels with total gross tonnage of 60,180 (all self propelled) are building in Pacific Coast yards. This means that approximately 33 per cent by number and 15 per cent by gross tonnage of the self propelled vessels building in American yards are in Pacific Coast yards. Among these are the two largest vessels building in America.

Practically all of the shipbuilding represented here will be completed before the end of the year.

Of the totals shown, 33 vessels with an individual gross measurement of over 1000 tons and a combined gross measurement of 246,819 tons are building for private American interests. These figures include all vessels receiving a government construction-differential subsidy. The 33 ships have a combined total horsepower of 290,750, of which 247,400 shp is generated through steam turbines in 29 vessels; 41,000 shp is generated through steam turbo-electric in 2 vessels; and 2,350 shp is generated by diesel in 2 vessels.

The six cargo vessels with 40,080 total horsepower listed in the table as diesel powered are building in an American yard for the French government.

RECAPITULATION OF SHIPBUILDING CONTRACTS IN EXISTENCE JANUARY 1st, 1947
AS TO TYPE AND PROPELLING POWER

Type	No.	Gross Tons (Est.)	Reciprocating		Turbine		Turbo-Electric		Internal-Comb.		Diesel Electric	
			No.	H.P.	No.	H.P.	No.	H.P.	No.	H.P.	No.	H.P.
Cargo Ship	36	224,591	—	—	30	227,400	—	—	6	40,080	—	—
Cargo-Refrig.	12	63,900	—	—	12	89,100	—	—	—	—	—	—
Passenger—Cargo	8	83,184	—	—	6	53,350	2	41,000	—	—	—	—
Tanker	2	24,450	—	—	2	18,900	—	—	—	—	—	—
Coastal & Harbor Tanker	4	4,105	—	—	—	—	—	—	4	3,029	—	—
Cargo-Coaster	—	—	—	—	—	—	—	—	—	—	—	—
Trawler-Steel	37	5,886	—	—	—	—	—	—	37	13,063	—	—
Trawler-Wood	12	1,345	—	—	—	—	—	—	12	2,990	—	—
Tug-Steel	7	1,549	—	—	—	—	—	—	4	3,200	3	3,600
Ferryboat	2	1,395	—	—	—	—	—	—	1	1,600	1	1,628
Towboat	12	5,505	1	1,625	—	—	—	—	11	16,000	—	—
Tank Barge	38	26,000	—	—	—	—	—	—	—	—	—	—
Hopper Barge	73	37,335	—	—	—	—	—	—	—	—	—	—
Derrick & Drill Barge	13	3,105	—	—	—	—	—	—	12	1,920	—	—
Cargo Barge	50	18,175	—	—	—	—	—	—	26	12,660	—	—
Dredge	3	6,640	—	—	—	—	—	—	—	—	—	—
Yacht—Launch—Aux.	9	960	—	—	—	—	—	—	8	3,970	1	600
Totals	318	508,125	1	1,625	50	388,750	2	41,000	121	98,512	5	5,828

Self-Propelled Vessels — 179 — 428,150 gross tons — 535,715 horsepower.
Non-Propelled Vessels — 139 — 79,975 gross tons.

Running Lights

Edited by B. H. BOYNTON

Interior view of American President Lines' new Southern California passenger offices, designed by Walter Dorwin Teague and Associates. The "viewers" set in the counter are for the insertion of colored slides with Round-the-World scenes as well as features on shipboard.

Passenger Offices Reaching New Heights of Attractiveness

LOOKING FORWARD to a greatly expanded volume of overseas passenger steamship travel, with Southern California the point where much of this business will originate, the American President Lines has opened its magnificient new passenger offices at 514 West Sixth Street, Los Angeles, in the heart of "Transportation Row."

Designed by Walter Dorwin Teague, celebrated industrial designer, whose staff has been at work on the premises for the past eight months, the ultra-modern,

Henry F. Grady, president, American President Lines, congratulates Ronald M. De Long, general passenger agent for Southern California on the occasion of the formal opening of the new passenger offices.

streamlined offices were officially opened to the public Friday morning, January 24. Many new and novel refinements for the comfort and convenience of patrons and for the display of information concerning President Line ships and services are features of the new ground floor ticket offices.

One feature of the office is the "viewers" set into the counter, in which colored slides can be inserted, displaying scenes on ship and shore in various parts along the Round-the-World route.

Ronald M. DeLong, American President Lines' general passenger agent for the Southern California district, will be in charge of the new location. Edgar M. Wilson, the company's General Agent in Southern California, will maintain his headquarters on the third floor of the same building.

In announcing the passenger office opening, President Henry F. Grady said:

"We are trying to anticipate the expected heavy demand for de luxe passenger steamer service to the Orient and around-the-world as soon as the postwar emergency travel subsides and we have our new fleet of luxury passenger liners.

"The first of these large transpacific vessels, the S. S. President Cleveland, now nearing completion at Bethlehem-Alameda Shipyards, will probably be ready for service in June of this year. Her sistership, the President Wilson, is scheduled for delivery in early fall.

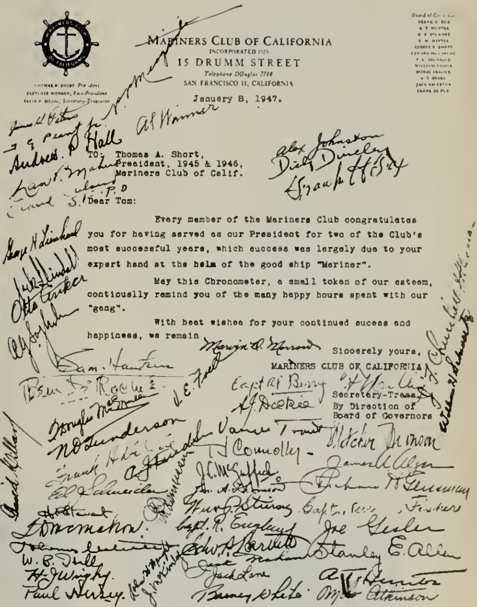
"In addition we expect eventually to have a fine well-balanced fleet of smaller luxury liners in the Round-the-World service, two of which, the President Polk and President Monroe, are now in operation."

Dr. Grady announced further that American President Lines would open a similar passenger office, also designed by Walter Dorwin Teague, in San Francisco at 152 Geary Street, just off Union Square, on or about February 15.

American President Lines' passenger department staff, left to right: Bingham F. Muller, Everett Nicholson, Ronald M. De Long (general passenger agent, in charge of the new office); Matilda Weinstein; Hugh Mackenzie (vice president, passenger traffic, who came from San Francisco headquarters for the opening ceremonies); Robert G. Dinwoodie (district passenger agent); George L. Crow; Tom Jones.

The pleased smile on Tom Short (left) retiring prexy of Mariners Club, is over the Chronometer given him by club members when he turned the gavel over to Fletcher Monson (right) general sales manager of General Engineering & Drydock Co., who was recently elected president.

1947 Officers of Mariners Club, San Francisco



MARINERS CLUB OF CALIFORNIA
15 DRUMM STREET
Telephone DOuglas 2714
SAN FRANCISCO 11, CALIFORNIA

January 8, 1947.

TO: Thomas A. Short,
President, 1945 & 1946,
Mariners Club of Calif.

Dear Tom:

Every member of the Mariners Club congratulates you for having served as our President for two of the Club's most successful years, which success was largely due to your expert hand at the helm of the good ship "Mariner".

May this Chronometer, a small token of our esteem, contiously remind you of the many happy hours spent with our "gang".

With best wishes for your continued success and happiness, we remain

Sincerely yours,
MARINERS CLUB OF CALIFORNIA
Secretary-Treas.
By Direction of
Board of Governors

Al Wanner
Hall
Alex Johnston
Sam. Hawkins
Capt Al Berry
A. J. Dickie
Vance Trout
T. J. Connolly
Fletcher Monson
James A. Alger
J. C. McGuffick
Joe Gesler
Stanley E. Allen
W. B. Tully
H. J. Wright
Paul Hurley
Jack Lane
Barney White

▲ Above: Charles Rice; Rear Admiral J. A. Alger, USCG (retired); Stanley Allen; Fletcher Monson, new master of the SS Mariner; Tom Short, retiring president; Felix Billig, and Capt. Al Berry.

▼ At left: Jack Clark, Lou Deppman, Ed Whittemore, John E. Egan. At right: A. M. Chriistianer, Fred Archbold, George L. Crowe, George Barr, "Dad" Le Count, David Neilson.

Executives of C. C. Moore & Company

Left to right: H. H. Smith, president of C. C. Moore & Co., Engineers. F. S. Cummings, vice president of C. C. Moore & Co., Engineers and D. P. Vail, commercial vice president in Los Angeles.

New President of United Engineering

Election of Commodore Lisle F. Small, U.S.N. retired, as president of United Engineering Company is announced by Raymond P. Hasenauer, who retires from that office to resume his duties as treasurer of the Matson Navigation Company.

Commodore Small joined United last fall as executive vice president. He had previously been Commandant of the Norfolk Naval Shipyard. Hasenauer, who has been on leave of absence from Matson, will continue to take direct interest in United as a member of the company's Board of Directors.

Commander Lisle F. Small, president, United Engineering Co. and Raymond P. Hasenauer, who resumes his duties as treasurer of Matson Navigation Company.

Morris Guralnick Establishes in S. F.

Morris Guralnick announces the opening of his office to practice marine surveying, naval architecture, and marine engineering. He is located in the Transport Building at the foot of Mission Street.

Mr. Guralnick has been connected with the marine industry continuously since 1933 when he was graduated from the Massachusetts Institute of Technology with a degree in naval architecture and marine engineering. He went to sea for a year to round out his training and obtain an engineer's license. Recently he has been Chief Estimator of Ship Repair for the Kaiser Richmond Shipyards, retaining the responsibility of the position during the change from "cost-plus" to firm price contracts.

Following the decline of ship repair activities at Richmond, Mr. Guralnick demonstrated his versatility by supervising the preparation of contract plans and specifications for converting a Victory ship to a self-unloading bulk carrier using the Leathem D. Smith system of unloading.

In former years, Guralnick was connected with Gibbs and Cox of New York and the Cramp Shipbuilding Company of Philadelphia in both ship design and estimating. He brings a well rounded background of training and experience to the assistance of ship operators and prospective owners on the West Coast. He is a member of the Society of Naval Architects and Marine Engineers and the U. S. Naval Institute, and is a contributor to several trade publications.

Morris Guralnick

Shoreside Personalities

THOMAS W. SMITH, marine surveyor of many years' standing in San Francisco, is now established in his own office at 109 Clay Street.

McLean of Alameda Retires

Fredric McLean, 69, Piedmont, assistant to the manager at Bethlehem-Alameda Shipyard, Inc., in Alameda, retired on January 1 after 28 years of service with the company.

Mr. McLean, who was born in Blackburn, Lancastershire, England, came to the United States in 1907. He started to work for Bethlehem as a draftsman in 1917 at what was then the Union Iron Works Plant, Bethlehem Shipbuilding Corporation, Ltd., in San Francisco. Later that year he was placed in charge of an engineering drafting department at the Alameda Yard of Bethlehem Shipbuilding Corporation, Ltd. In 1919 he was made assistant manager at this Yard, a position he held until 1924 when he was made assistant superintendent at the Yard. From 1925 to 1940 Mr. McLean was general superintendent at Bethlehem's Alameda Repair Yard.

Two years later, and up until 1944, he was manager of both Bethlehem-Alameda Shipyard, Inc., and Bethlehem Steel Company's Alameda Repair Yard. He was appointed to the position held at his retirement in August of 1945.

Mr. McLean is married and has a daughter and a son who is principal surveyor for the American Bureau of Shipping in Portland. He plans to spend the first year of his retirement seeing the United States in his automobile, with a trip to his native England contemplated in the not too distant future.

Frederick McLean

W. Miller Laughton presides at the first meeting of the new year at the San Francisco Propeller Club. Left to right: Robert H. Wylie (Brigadier General, USA, retired) newly appointed manager for the Harbor Board; E. Russell Lutz (behind the bell); Mayor Roger Lapham; J. J. Geary, retiring prexy; Wm. Laughton, new prexy; and Joseph Moore, Jr.

Allis-Chalmers Field Organization Changes

W. C. Johnson, vice president in charge of the general machinery division of Allis-Chalmers Manufacturing Company of Milwaukee, Wisconsin, announced an important change in the division's field organization, a change aimed at furthering customer service.

District offices will be grouped under the direction of regional managers who will each have a staff of specialists, and the regions will operate as self-contained field units.

The first regional managers, who will act as a nucleus for building the first four regional organizations are:

W. F. Taylor who will supervise the New England area, who formerly was manager of the Allis-Chalmers district office in Boston, Massachusetts. D. S. Kerr will handle the Southeast. He was manager of the Atlanta, Ga., district office and at one time was connected with the district office at Knoxville, Tenn. The Southwest will be supervised by J. L. Pratt, who has been manager of the Dallas, Texas office, while A. J. Schmitz will continue to direct operations in the Pacific Coast area. Before assuming the regional post, Schmitz was in charge of the company's operations in Havana, Cuba, and he also has been in charge of the district offices in Portand, Oregon, and Seattle, Washington.

The New Fuller-Nason Industrial Division

Establishment of the new Fuller-Nason Industrial Division of W. P. Fuller & Co., combining the specialized industrial finishes departments of two pioneer Western paint companies, has been announced by President A. H. Brawner.

Effective February 1, the new division brings together the industrial finishes sections of W. P. Fuller & Co., oldest and largest Western paint firm, and R. N. Nason & Co., also a pioneer company and a leader in the development of many modern industrial finishing products and techniques.

Outside the field of industrial finishes, the two companies will continue their independent operations.

Construction of a $1,000,000 plant specially designed to provide the most modern production, control and research facilities for all of the many types of specialized industrial finishes has been started at Fuller's South San Francisco factory.

President D. J. Tight of R. N. Nason & Co., enters the Fuller organization as Industrial Advisor. His place in the Nason organization will be taken by W. W. Holt, for many years a co-worker with Mr. Tight in direction of that company's affairs.

W. P. FULLER, SEATTLE BRANCH MANAGER is Byron W. Butler to succeed George W. Feldmann.

J. Herbert Todd

J. Herbert Todd Now With Staten Island Firm

J. Herbert Todd, formerly vice president and director of Todd Shipyards Corporation and one of the leading figures in the shipbuiding and ship repair industries of the country, has allied himself with the Brewer Dry Dock Co., Mariners Harbor, Staten Island, in the capacity of vice president.

Son of the late William H. Todd, one of America's greatest shipbuilding geniuses who started life as a riverter in the Pusey & Jones yard in Wilmington, Del., Herbert Todd brings with him a tradition of jobs "well done" that span the past 31 years.

Hayes Manufacturing Buys American Engineering

It has just been officially announced that effective October 1, 1946, the Hayes Manufacturing Corporation of Grand Rapids, Michigan, became owner of the American Engineering Company and its subsidiaries. The American Engineering Company retains its corporate identity as it will not be merged with Hayes.

William F. (Pop) Schuerbrock, (center) San Francisco, has retired after serving 40 years with the Army marine transportation service, 35 of them at sea as a marine engineer. William C. Blake, Chief of Engineer Branch, Superintending Marine Engineer Office, SFPE, and Mr. P. H. Thearle, the Port's Superintending Marine Engineer.

Pop Schuerbrock Retires

William F. Schuerbrock, "Pop" to most of San Francisco's maritime industry, began an uneasy retirement January 6 after 40 years of Army marine engineering at sea and ashore.

"Pop" came to work for the Army transportation service in the spring of 1907 as third assistant engineer aboard the Logan. For the next 35 years he served on such old-time troop carriers as the Thomas, Meigs and Grant. He was chief engineer of the Grant for 12 years prior to coming ashore in 1941 when the Navy took over that veteran transport.

During the war he was placed in charge of fire prevention aboard all Army owned or allocated ships during their stay in S. F. Port of Embarkation. So well did he do the job that there was not a single serious fire aboard any Army vessel during the war, or in the equally busy demobilization period which followed.

The men and women of the office of Superintending Marine Engineer P. H. Thearle of Port Water Division, on learning of Pop's retirement plans, are buying an easy chair in which to take that well-deserved rest.

AMERICAN EXPORT'S MEMORIAL BELL

To commemorate the 14 Deck and Engine Officers lost through enemy action on company vessels during the war, the American Export Lines was presented with a memorial bell by the Brotherhood of Marine Officers during ceremonies January 16 at company offices, 25 Broadway, New York City. Capt. Cecil D. Davies made the presentation to J. E. Slater, executive vice president, American Export Lines. Left to right are: J. F. Gehan, vice president; L. S. Andrews, operating manager; Mr. Slater; Capt. Davies, Henry K. Urion, Brotherhood attorney, and E. F. Farr, Brotherhood secretary.

Accident Prevention Conference

SAFETY TROPHIES AWARDED PACIFIC COAST WATERFRONT CONCERNS

H. Gade, supt., San Francisco Stevedoring Company; C. Gielow, supt., San Francisco Stevadoring Company; Capt. J. S. Gade, general manager and pres.; A. M. Ramsay, marine surveyor and safety engineer, Fireman's Fund Insurance Company; J. Olsen, supt., San Francisco Stevedoring Company.

At right: Gordon Woods, representative of East Bay Terminals Assn.; A. Scharff, Foreman, Howard Terminals; Peter Howard, supt. of operations, Howard Terminals; Captain Cyril Meeks, traffic manager, Jones Stevedoring Company; W. Mellor, supt. Jones Stevedoring; W. E. Jones, Sr., president, Jones Stevedoring; F. C. Wagener, general manager, C. J. Hendry Company.

Above, top: Lary Miller, chief safety engineer of the Pacific Employers Insurance Company, presents the Pacific Employers' trophy to R. S. Gray, asst. gen. supt. of the Matson Navigation Company. Below: T. W. Buchholz, operating manager, Metropolitan Stevedoring Company, presents Bilge Club Safety Trophy to Charles Bayly, president, Crescent Wharf & Warehouse Company.

Left: Captain O. W. Peason, v.p., Marine Terminals; C. J. Chodzko, operating supt., Long Beach Terminals; T. R. Karlson, operation supt., Seaboard Stevedoring Company; J. H. Travers, mgr. of the Accident & Prevention Bureau, Waterfront Employers Association of the Pacific Coast; and Walter Martinell, operating supt., Associated-Banning Company.

Right: Larry Powers, stevedoring supt., Matson Navigation Company; Capt. H. H. Gillespie, operating supt., Matson Navigation Company; Larry Sullivan, foreman, A. C. O'-Neal, foreman; Herman Hargett, foreman and R. S. Gray, asst. general supt., Matson Navigation Company.

At bottom, left: Larry Powers, stevedoring supt., Matson; T. W. Buchholz, operating mgr., Metropolitan Stevedoring Company; J. H. Travers, Jack Waters, operating supt., Pope & Talbot and chairman of the Southern California District Accident Prevention Committee, and Jack Berry, asst. gen. mgr., Outer Harbor Dock & Wharf Company.

At right: Frank P. Foisie, pres. Waterfront Employers Assn. of the Pacific Coast; William Bryant, dist. mgr., General Steamship Corp.; Captain H. H. Gillespie, operating supt., Matson Navigation and William R. Marlowe, mgr., Southern District Waterfront Employers Assn.

Pioneer Hardwood Firm

In 1872 the San Francisco waterfront was a forest of masts. Sailing vessels were the backbone of ocean commerce. This sight was typical of all the great ports of the world. Most of these vessels were built of wood and a great deal of hardwood was required for fenders, stems, sterns, stern posts, rudder stocks, rails and deck houses. Foreign ships, British, Norwegian, Danish and German, were seen, together with a number of the fine old New England built clipper ships, such as, Sovereign of the Seas, Glory of the Seas and many others of the famous old time craft.

Practically everything was built of wood and to cater to this demand, in 1872 Peter and Asa L. White entered the hardwood business.

In those days most of the hardwoods were brought around the Horn by sailing vessels from the eastern producing centers of Maine, Vermont and New Jersey. Every type of vessel coming into the Port of San Francisco required for its carpenter stock alone, a very considerable amount of oak and ash, making up in the aggregate quite a business. There was also considerable shipbuilding around the Bay of San Francisco. Shipyards like Middlemass and Boole at Hunters Point, Charles White at North Beach and many others were active in building sailing vessels, and later on, steam schooners, which were used in the Oregon Pine and Redwood lumber carrying trade from the northern mills. All these vessels used hardwood in various parts of their structures.

It was the custom in the early days, when a sailing vessel or a steam schooner was built, to secure the money by selling shares in the vessel. This was divided into 128ths, 64ths, 32nds, and so on. Merchants supplying material for a vessel to be constructed were brought in to take shares, usually for the amount of their material which went into the finished vessel. The operating owner, of course, usually invested much more than the lumber dealers, ship chandlers and other merchant suppliers. The small steam schooners of the early days usually took about $6,000 worth of hardwoods. The founders of White Brothers were part of this method of building ships, and had considerable money invested in this manner. The returns, in the early days, were very good,—sometimes the entire amount invested being paid back in five or six years.

Early day view of original White Bros. plant in San Francisco.

Present plant at 5th and Brannan Streets, San Francisco.

As time went on, steel vessels replaced the wooden vessels and the demand for hardwoods changed in the uses to which the lumber was put. As fine yachts were built finer woods were required and White Brothers furnished the hardwoods for many of the finest and most famous yachts built on the Pacific Coast. They still specialize in hardwoods such as oak, ash, ironbark, plywoods, —in fact, everything for the shipbuilding and boatbuilding industry.

The founders, Asa L. White and Peter White, have been gone from the scene for many years and for the last forty years the business has been under the management of W. T. and C. H. White. Now the younger men, William T. Meyer, Keith McLellan, Don F. White and Charles B. White, have taken hold. All these gentlemen have had years of experience in the hardwood industry with White Brothers—all of them brought up in the business from boyhood. Thus the basis remains for the continuation of White Brothers as Hardwood Headquarters for another 75 years.

..BENDIX-SCINTILLA FUEL INJECTION EQUIPMENT

Means Dependable Performance for Diesel Engines

Around the world, wherever American Diesels are in operation, Bendix-Scintilla* Fuel Injection equipment provides reliable performance under even the most difficult conditions. In frigid Greenland, in stationary engines in Russian oil fields, in the South Sea tropics, on African railways, and on ships of all types, Bendix-Scintilla spells extra performance and dependability. Specify Bendix-Scintilla—the name that is known for reliability the world over!

*TRADE MARK

BENDIX SCINTILLA

SCINTILLA MAGNETO DIVISION of
SIDNEY, N. Y.

Bendix
AVIATION CORPORATION

Pacific MARINE REVIEW NEWS FLASHES

TWO VICTORYS TO BE CONVERTED FOR BELGIUM

The Victory ships Pomona Victory and Westminster Victory, now on the Pacific, will be given temporary conversion so as to carry crews of 100 and 170 passengers each between the Belgian Congo and Antwerp. The work will probably be done in a Pacific Coast yard. Owner is Compaguie Maritime Belge SA Antwerp.

* * * * *

BETHLEHEM LOW BIDDER ON THREE SHIPS

Conversion work on three APA vessels to cargo design C3-S-2A for Pope & Talbot, Isthmian Line, and Matson Line has been awarded to Bethlehem's Boston yard on its low bid to the Maritime Commission.

* * * * *

RECONVERSION OF SEVENTY-ONE VESSELS UNDER WAY

Now in progress is reconversion of 71 merchant vessels which served as naval auxiliaries. They are mostly of C2 and C3 design but include the Argentina, Brazil and Uruguay. The work is being handled in 26 shipyards.

* * * * *

MATSON-OCEANIC GETS FIRST OPERATING SUBSIDIES

First granting since before World War II of Government financial aid to enable a United States steamship operator to meet foreign competition was announced January 3 by the Maritime Commission. The recipient of the new operating-differential subsidy is the Oceanic Steamship Co., of San Francisco, subsidiary of the Matson Navigation Co. and one of six lines which last summer sought new or modified subsidies on transpacific services.

* * * * *

ARMY RELEASING TWELVE TROOPSHIPS

Brigadier General N. H. McKay, commanding S. F. Port of Embarkation, is releasing 12 troopships to the Maritime Commission. Most of these are Victorys, 11 of the vessels will be decommissioned on the West Coast, 1 in Seattle and 10 at San Francisco.

* * * * *

PERMANENT ARMY FLEET

The San Francisco Port of Embarkation in addition to 16 Maritime Commission vessels has 27 Army transports and 5 freighters which form the nucleus of the permanent peacetime fleet operating out of San Francisco.

* * * * *

MARITIME COMMISSION ANNOUNCES NEW C3 DESIGN

Re-design of its standard C3 cargo ship for increased speed, carrying capacity and economy of operation was announced by the United States Maritime Commission as a step in its plans to improve the competitive position of the American Merchant Marine in postwar international trade.

Plans and specifications have been completed, and invitations for bids will be issued upon receipt of applications from shipping lines for purchase of the new model.

The new design, designated C3-S-DB3, will have more horsepower, and a speed of about 18¾ knots compared to the 16½ knots of the present C3. It will also feature rearrangement of the hull structure and cargo gear for more economical handling and stowage of cargo. Six holds will be provided instead of five as in the present design, and the midship holds will have twin hatches side by side for quicker and easier placement of cargo.

* * * * *

SENATE SHIPPING COMMITTEE

Senator White of Maine will be chairman of the Senate Interstate and Foreign Commerce Committee during the 80th Congress. Other members of the Committee are Tobey, Reed, Brewster, Hawkes, Moore, Capehart, Johnson, Stewart, McFarland, Magnuson, Fulbright, Myers, McMahon.

* * * * *

PREWAR SHIPS NEARLY ALL RETURNED

Of 900 merchant vessels which were requisitioned for war service only 25 remained to be redelivered to their owners. The ships already returned include 460 dry cargo carriers, 341 tankers, 36 passenger ships, 34 colliers, three barges and one cable ship. Still to be redelivered are 20 passenger ships and 5 dry cargo vessels.

* * * * *

SOUTH AMERICA TRADE EMPLOYS 300 U. S. SHIPS

Almost 300 American merchant ships are engaged in trade between the U. S. and South American ports. This fleet is almost five times the number of vessels that postwar surveys indicated would be necessary.

* * * * *

FORD TO HOLD PURCHASE EXHIBIT IN SAN FRANCISCO

The Ford Motor Company will hold a gigantic parts purchasing exhibit in San Francisco February 17 and 18 and intend to purchase their requirements for 2600 different automobile and truck parts from California manufacturers. It is expected that purchases will be in excess of $50,000,000 annually. The exhibit will be at the Fairmont Hotel.

* * * * *

THE RICHMOND SHIPYARDS

Evaluation of the Government-owned Richmond Shipyard will take place shortly. George H. Thomas of San Francisco and R. W. Kittrellie of Oakland have been selected to appraise the properties which cost the Government $26 million. Completion of the appraisal by about the end of March was anticipated. Information on real estate at the shipyards may be obtained from the WAA Office of Real Property Disposal at Room 212, 1182 Market Street, San Francisco.

WAA now has custody of Yard 2 (largest of the former Kaiser war plants in Richmond), the Pre-Fabrication plant, Warehouse A and Hopeman Brothers warehouse. The firm of LeBoeuf and Dougherty, Inc., has been awarded a contract for protection and maintenance of the shipyards in WAA custody.

* * * * *

Thermador Electrical Mfg. Co. has purchased the Rotom Mfg. Co., Alhambra, Calif. This will be operated as a Thermador unit, making fractional horsepower electric motors.

* * * * *

WOULD INCLUDE RADIOMEN WITHIN DEFINITION OF OFFICERS

Senator Morse, Oregon, on January 6, introduced a bill (S.75) to amend the definition of vessels of the United States and officers, contained in the Revised Statutes (46 U.S.C. 221), so as to include chief radio-telegraph operators and assistant radio-telegraph operators within the term "officers". The measure was referred for consideration to the Senate Committee on Interstate and Foreign Commerce.

MARITIME COMMISSION STATISTICS

Ships built by U. S. Maritime Commission 1939 to November 1, 1946	5,860	57,106,038 dwt
Merchant Fleet owned by U. S. Gov't and U. S. Citizens October 1	5,756	57,406,300
Includes dry cargo 1,000 gross tons and over and tankers of 1,600 gross tons and over		
U. S. owned ships under Maritime Commission control	1,504	15,938,800
148 allocated to carry UNRRA cargo,283 to carry International Programs cargo, 76 troop ships		
Lend-lease and bareboat chartered to foreign governments	442	4,002,900
Army	285	2,242,800
Navy	418	3,682,900
Reserve Fleet (includes 3 dry cargo and 24 tankers incomplete)	1,563	15,862,700
Vessels returned, sold or chartered to U. S. private companies	1,544	15,676,200
Number of men in U. S. Merchant Marine Labor Force (Sept. 1946) (Includes shore reserve)		197,000
Long tons of cargo shipped from U. S. on all flag vessels during 1945		83,469,000

* * * * *

HALE PROPOSES EXTENSION OF U. S. ADMIRALTY JURISDICTION

Extension of the admiralty and maritime jurisdiction of the United States to include all cases of damage or injury, to person or property, caused by a vessel on navigable water, notwithstanding that such damage or injury be done or consummated on land, was proposed January 3, 1947, in a bill (H.R. 238), introduced in the House by Representative Hale, Maine. The measure, which was referred for consideration to the House Judiciary Committee, also would provide that "in any such case suit may be brought in rem or in personam according to the principles of law and the rules of practice obtaining in cases where the injury or damage has been done and consummated on navigable water".

Metals Congress at Oakland in March

Plans for the American Society for Metals Congress, with affiliate organizations—to be held in Oakland in March—are completed. Sixteen organizations have agreed to go "all-out" in cooperation with the parent group's show.

The Congress and Exposition, expected to attract 55,000 persons from all over the nation during the period from March 19 to 29, is one of the largest conventions to be held in the nation, and is the largest show of its kind in the world.

Tied in with the Congress will be the American Metals Conference of representatives of the following groups:

The American Chemical Society, American Foundrymen's Association, American Industrial Radium and X-Ray Society, American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Tool Engineers, American Welding Society, Society of Automotive Engineers, American Petroleum Institute, Mining Association of California, Northwest Electric Light & Power Association, Pacific Coast Electrical Association, Western Oil & Gas Association, and Purchasing Agents Association of Northern California.

The Congress, popularly known as the Western Metals Congress, last was held in Oakland in 1931. Such expositions were not held during the war. Now, getting back into the pattern of postwar development, it is a bigger event than ever before, and both exposition buildings are completely sold out.

Accident Prevention in Pacific Coast Marine Operations

(Continued from page 47)

Now poor or unsafe physical conditions actually are responsible for only about 25 per cent of all longshore accidents. Why then this seeming preoccupation with conditions? Only this. They are much more obvious than unsafe work methods or unsafe acts of men. If an unsafe physical condition exists it is rather difficult to interest the workman in his own unsafe acts. On the other hand if management will clean up on the physical conditions under its control, then it can more successfully and with a greater hope of obtaining cooperative action, appeal to the men to correct their unsafe habits.

The Bureau's Supervisors are also on the look-out for unsafe or accident-producing methods of work and where they are found, recommendations for safer methods are made to those in charge. The unsafe acts of an individual workman, (what he actually does with his hands and his feet, how and where he places his body), contribute to many of the accidents. In about 16 per cent of all stevedoring accidents, the unsafe act is the sole cause of the man being injured. However, in 95 per cent of all accidents, not only are there unsafe acts but also unsafe conditions (25 per cent), and unsafe methods (59 per cent). Here a correction of any one of the three —physical conditions, methods of work, or acts of workmen would undoubtedly prevent an accident.

3. The third part of the program is EDUCATION. perhaps "training" would be a better word. Training is needed all along the line. Training of management to accept its responsibilities for providing and administering an accident prevention program; training for supervisors to enable them to properly and efficiently carry on their work of supervising and instructing their personnel; and training of longshoremen in the safe and proper way of performing their work.

During the 20 years the accident prevention program has been under way, various means of accomplishing this training have been used. For management, committee meetings, statistical material, bulletins, all have been used, and successfully, for accident prevention work is now accepted and practiced by far more of our managements than was the case 20 years ago.

Training for supervisors has been carried on through foremen's dinner meetings, through first aid courses, and during the war years, by courses in foremanship. Some progress has been made, but much yet remains to be accomplished and it is expected that more and more time and effort will be spent on training in the immediate future.

Training of the longshoremen themselves has been given plenty of thought over the years, but not much has actually been done. First aid courses have been given and during the war years training programs for winch drivers and lift truck drivers were put on. However, so far that has been the extent of the training. It is hoped in the future that, with the cooperation of the Union, more can be done along training lines for here lies the greatest opportunity for reducing the number of accidents.

4. CONSULTATION. By consultations with management, the Bureau is often able to aid in the solution of the various accident prevention problems with which the industry is confronted.

The program has been successful. The number of accidents has been reduced as evidenced by a 70 per cent reduction in injury frequencies for last year over the 1927 experience. How many lives have been saved and how many men are today working on the various Pacific Coast waterfronts with arms and legs intact, who might not be had there not been an accident prevention program, cannot be known accurately, but they must run into the hundreds.

It has been especially gratifying that during the war years, despite the influx of new men, the handling of new types of cargos, and the strain that was inevitably present in those days,—nevertheless, despite all these handicaps, year by year the injury frequency was reduced. Who or what was responsible for this continued decline? The knowledge by management that accidents could be prevented and their determination that they would be on their own individual jobs, is the answer to that. By continued interest and follow-up in their own companies, the rate was kept down. Some companies were more successful than others but on the whole, each company's record reflected the degree of determination of that company to reduce accidents.

While the industry can take credit unto itself for the good it has done, it must not be satisfied to rest on its laurels, for there is still much work to be done. Stevedoring is still well up in the list of hazardous occupations and it is only by continued effort that its relative position can be lowered.

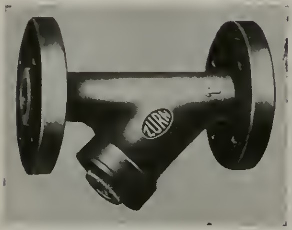
The interest and participation of the member companies in this program is not based on altruistic motives alone, but rather on an enlightened self-interest which, after all, is the best possible basis for sustained effort. The companies benefit through a reduction in costs, resulting from a decreased number of accidents. Compensation insurance premiums are reduced. Losses due to breakage of gear and damage to cargo are reduced. Last but by no means least, are the benefits to the longshoremen themselves. To them there are two types of benefits: first, the financial one, for without injury their ability to earn remains unchanged; second, the incalculable benefit of freedom from pain and suffering and loss of life.

From the beginning this entire program has been a voluntary one on the part of the companies. There has been no compulsion by State or Federal agencies requiring participation. The control has been vested sole-

(Please turn to page 91)

Keep Posted

New Equipment and
Literature for Yard,
Ship and Dock



The "Y" strainer of J. A. Zurn Manufacturing Company.

Zurn "Y" Strainer

A "Y" Strainer, manufactured by the J. A. Zurn Mfg. Co., Erie, Pa., has been designed which has the perforated strainer sleeve snugly fitted into the body. This enables the strainer to be installed in close quarters where space is limited, in addition to preventing the sleeve from getting out of place or vibrating.

The strainers, by cleansing liquids and steam of solids, afford protection for pipe line equipment such as valves, pumps, traps and other mechanical apparatus. All units are hydrostatically tested according to service conditions under which they are required to operate.

Available with or without plug at cleanout, and a magnetized strainer plug for intercepting ferrous particles too small to be retained by a strainer sleeve. Made of cast bronze, brass, cast iron and cast steel, and with flanged, threaded or butt-weld connections.

Dearborn Diesel Cooling Water Comparator

How diesel engine cooling system can be safeguarded with Dearborn cooling water comparator plus Dearborn treatment is described in a recent bulletin issued by the Marine Division of the Dearborn Chemical Company. This pamphlet is available through their various marine offices and is used in conjunction with Dearborn Engineering Service.

The comparator illustrated here and also in the bulletin is a compact duplex unit containing chromate and pH standards calibrated for use with the standard types of Dearborn diesel cooling water treatment.

Frequent checking of the jacket water with this visual unit gives an accurate indication of the treatment adjustment required to keep the system both corrosion- and scale-free.

Navy Direction Finding Equipment for Civilian Navigation

The Lear Radio Direction Finder (Model DBD), developed for the Navy Department during the war, and now released for private and commercial navigation, is basically a highly sensitive radio receiver, using superheterodyne circuit in combination with certain other circuits necessary for radio compass operation.

The equipment is designed for remote control operation, with provision for either single or dual control. Shock mounted, the remote control units are of special design which facilitates ease and accuracy for the four methods of operation: (1) automatic compass; (2) matched line indicator; (3) sense antenna (non-directional reception); and (4) loop antenna (directional reception).

The complete radio direction finder equipment is operated directly from the usual 115 volt, 60 cycle ac power lines through a rotary type frequency changer which supplies the type of current required for the specialized radio compass circuits. No batteries of any kind are used. A total of 24 vacuum tubes are employed.

For complete data, write Lear, Inc., Grand Rapids, Mich.

The Lear Marine Direction-Finding System consists merely of these three compact units, with their basic accessories. All the benefits of electronic navigation as developed under U. S. Navy specifications are now available for commercial and private navigation.

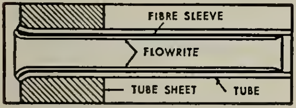
Rebuilt E. J. Block Fitted with NACO Blocks

From our old friend E. E. "Doc" Eyman, Manager of Marine Sales, National Malleable and Steel Castings Co., Cleveland, Ohio, we learn that the 552-foot ore carrier E. J. BLOCK, owned by Inland Steel Company and featured in the December Pacific Marine Review, is equipped with 180 fathoms of NACO cast steel stud link chain two inches in diameter for use on the two main bower anchors; and also 45 fathoms of 1-5/8" NACO cast steel stud link chain for her stream anchor.

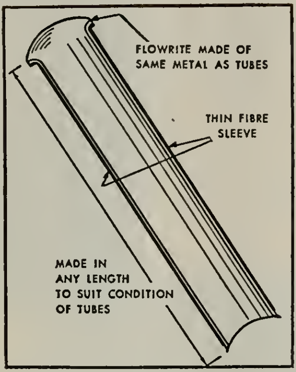
NACO-J cast steel stud link-chain.

Two Simple Inventions Offer Savings in Condenser Operation

W. B. Kennedy, president of Condenser Service & Engineering Co., Inc., Hoboken, N. J., recently announced two new inventions: the new Fiberclad Flowrite tube inserts, which stops condenser tube end erosion, seals tube leaks, prolongs life of old tubes and reduces water friction up to 80 per cent; and the new Detectaleak tube tester which instantly locates leaking tubes without necessity of dismantling condenser.



Fibreclad Flowrites can be used with any type of tube joint.



Cross section of Fibreclad Flowrite showing new fibre sleeve feature.

Flowrites, the metal belled-end tube inserts, have been used successfully to protect condenser tube inlet ends against erosion and to eliminate expensive shutdowns for tube replacements for over 20 years. Now the new type insert, called Fibreclad Flowrite, offers many important advantages over other types previously available. The Fibreclad tube consists of an unbreakable metal tube, similar to the old Flowrite, with a very thin fibre sleeve shrunk on the outside. The installation is simple, requires no cement and no special care. After installation, the fibre swells when in contact with water, producing a very tight seal which prevents leakage. These Fibreclad Flowrites are available for any size tube, in length to suit the erosion problem of the particular unit for which they are ordered.

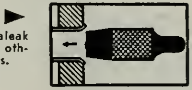
Detectaleak Tube Tester

The newly invented simple tool called Detectaleak tube tester is a handy tool in detecting leaking tubes instantly without dismantling the condenser. The tube tester consists of a rubber body, one end of which is conical to fit into the tube, and the other end is a thin-walled bulb. An air passage connects the bulb with the conical end. A knurled metal sleeve surrounds the body to provide a grip for the hand.

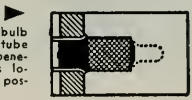
The illustrations show the simple, effective operation of the Detectaleak tube tester.

Plug one end of tubes with fibre plugs.

Insert Detectaleak Tube Testers in other end of tubes.



If Detectaleak bulb is sucked in, tube leaks. Each penetrated tube is located quickly, positively.



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PRODUCT__________ Page No.______

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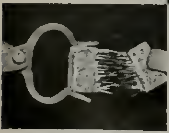


Lyman King, of King - Knight Co. and Captain Rufus G. Thayer, USN (Retired) now associated with King-Knight Co.

Thayer Joins King-Knight

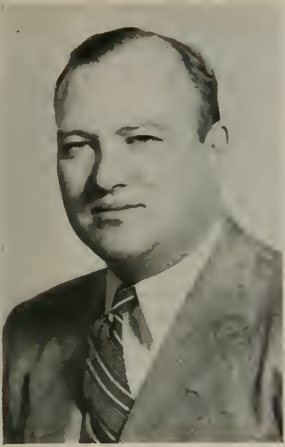
Captain Rufus G. Thayer, USN recently retired, is now with King-Knight Company.

His service record is as follows:

Appointed to the U.S. Naval Academy from San Francisco in 1917. Served on various battleships and destroyers in the Pacific and Asiatic fleets. After two years at Mare Island Navy Yard followed two years as Assistant Fleet Maintenance Officer on the staff of Commander Base Force; 1931 at the Naval Academy and University of California, and fleet engineering posts until 1937; 1937 to 1939 on the 12th Naval District staff.

In 1939 in charge of structural and metalsmith shops in fleet repair ship Vestal. In 1941 went to the staff of Commander Base Force as Force Material Officer with direct supervision over all fleet repair ships. Was in Pearl Harbor in this capacity when the Japs struck on December 7, 1941. Received a promotion and awarded Bronze Star medal for accomplishments in minimizing damage and prompt start of salvage work during and after the surprise attack. In 1943, to Ellice, Gilbert and Marshall Islands in charge of ship maintenance and repair activities in that area.

In 1944 went to the Naval War College in Newport, Rhode Island, for the command course, followed by a tour in the Navy Department at Washington in the material section of the office of Chief of Naval Operations. Left this assignment to take command of USS General Breckenbridge, a transport of the P-Z class, which he commanded until he retired recently to join King-Knight Company.



E. A. Harang

Harang Represents Thomas C. Wilson, Inc.

Thomas C. Wilson, Inc., Long Island City, N. Y., manufacturer of mechanical tube cleaners is pleased to announce the appointment of the Harang Engineering Company, 840 Lake Street, San Francisco, California, as its representative in the Northern California area.

Edward A. Harang, who heads the company bearing his name, is a graduate of the University of Michigan with a B. S. degree in chemical and mechanical engineering. For the past ten years he has been closely allied with the power industries.

During the war Mr. Harang, as a Lieutenant in the USNR, was assigned to the Bureau of Ships. His work entailed the handling and solution of propulsion and associated design problems. His experience and intimate knowledge of the problems encountered in the marine and stationary power field will prove helpful to all concerned.

NEW LOS ANGELES OFFICE FOR BABCOCK & WILCOX: The Babcock & Wilcox Tube Company announces that its Los Angeles Office has moved from its headquarters in the Banks Huntley Building on South Spring Street to: Petroleum Building, Rooms 750 and 751, 714 West Olympic Blvd., Los Angeles 15, California. The telephone is Richmond 7-3849 and 3850.

Shoreside Personalities

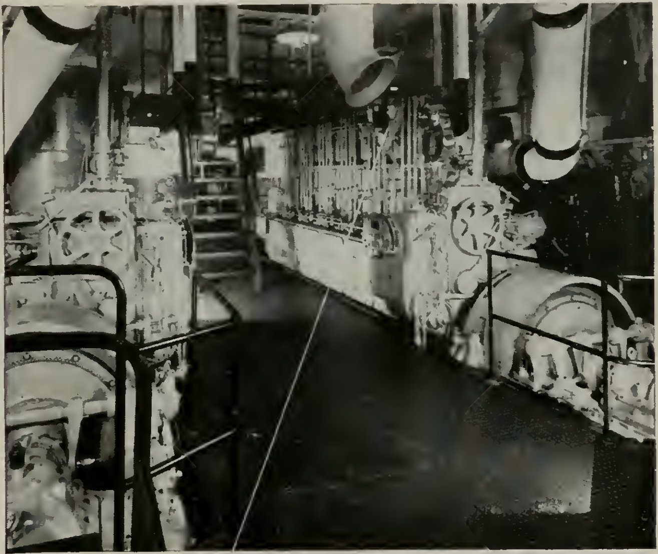
COMMANDER D. B. McMICHAEL, USMS, was transferred from his position as Officer-in-Charge, U. S. Maritime Service Center, 1000 Geary Street, San Francisco to become executive officer at the U. S. Maritime Service Training Station, Sheepshead Bay, New York.

* * *

CARSWELL MARINE ASSOCIATES: M. J. Gigy, Pacific Coast manager of Carswell Marine Associates, Division of Cargocaire Engineering Corporation, announces that Harry W. Parsons, formerly president of Harry W. Parsons, Inc., is now associated with the firm. Pacific Coast headquarters of Carswell Marine Associates is at 417 Market street, San Francisco.

* * *

UNITED ENGINEERING APPOINTMENT: Jack Massenberg was recently appointed manager of Engineering, Estimating and Planning, of the United Engineering Company, San Francisco.



Pope & Talbot in New Home

New headquarters and consolidated offices for all divisions of Pope & Talbot, Inc., pioneer West Coast shipping and lumber firm, were occupied in mid-January at 320 California Street, San Francisco 4, where a large portion of the first floor and the entire second floor is devoted to the Lumber Division, Steamship Division and executive headquarters. Executive offices have heretofore been in the Russ Building, and general offices at 461 Market Street.

Fifteen hundred square feet on the street floor of the new class A building just erected at this historic corner of California and Battery Streets is devoted to the Traffic and Claims Departments of the Steamship Division. On the second floor are the offices of President George A. Pope, Jr., and other executives, all of which face on the California, Battery and Halleck Street sides of the structure. General offices and staff are in the large central working area. A comfortable and well-appointed reception room faces the elevators on the second floor.

The most modern thought in office arrangement, lighting, acoustic control and color planning has been employed throughout. Easy-on-the-eyes pastel shades of green and tan have been adopted for the color scheme. Lighting is of the shielded fluorescent type and ceilings are entirely covered with sound-absorbing material.

Only personnel not affected by the move are those located at Pier 40 is the company's Purchasing De-Pope & Talbot Line coastal and intercoastal vessels, and to be the terminal of the company's re-established Pacific Argentine Brazil Line which will resume direct service with the east coast of South America in February. Also remaining at Pier 40 is the Company's Purchasing Department.

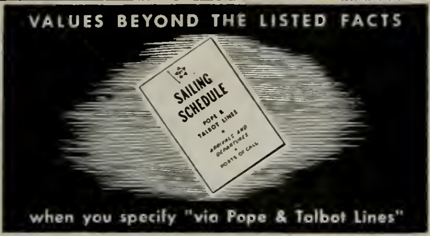
Other Pacific Coast terminals and offices of Pope & Talbot, Inc., are maintained at Seattle, Tacoma, Portland, Oakland, Stockton, Los Angeles and San Diego.

The first Pope & Talbot office was the cabin of Capt. W. C. Talbot and his partner A. J. Pope on board the sailing vessel which brought them to San Francisco in 1849. Experienced in both shipping and lumber, the partners remained on the Pacific Coast to establish lumber mills in the Pacific Northwest and a shipping service that has carried the American flag and Pacific Coast products to all parts of the world.

Nordberg Acquires Busch-Sulzer

Nordberg Manufacturing Company of Milwaukee, Wis. and Busch-Sulzer Bros. Diesel Engine Company of St. Louis, Mo. announced that Nordberg had acquired certain manufacturing assets from Busch-Sulzer, and proposes to continue its diesel engine business as a division of the Nordberg Mfg. Co.

Nordberg is a nationally known manufacturer of heavy machinery including diesel engines, and Busch-Sulzer is engaged in the production of diesel engines. The Busch-Sulzer Bros.-Diesel Engine Co. was founded in 1901 by Adolphus Busch.



Shippers tell us it is the "unlisted values" . . . the things that never show on the sailing schedule or shipping documents . . . that make Pope & Talbot Lines' service more valuable.

They mean such factors as dependability . . . experienced personnel . . . a wide-flung organization of men capable and anxious to assist shippers in solving marketing and transportation problems.

The "listed facts" are important too . . . a fleet of fast, modern ships . . . regular schedules . . . improved dockside facilities . . . stowage and adaptability . . . safe handling. Put your problem up to Pope & Talbot men. Write for Sailing Schedule.

POPE & TALBOT LINES
PACIFIC COASTWISE SERVICE
PUERTO RICO SERVICE FROM PACIFIC COAST PORTS
INTERCOASTAL SERVICE BETWEEN ATLANTIC AND PACIFIC PORTS

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EXECUTIVE OFFICES
320 California Street • San Francisco 4

Offices and Terminals
SEATTLE 4
TACOMA
PORTLAND 9
SAN FRANCISCO 4
OAKLAND 7
STOCKTON
LOS ANGELES 15
SAN DIEGO
NEW YORK 6
PITTSBURGH 22
DETROIT 2
PHILADELPHIA 6
BALTIMORE 2
NORFOLK
SAN JUAN, P. R. 18

Accident Prevention in Pacific Coast Marine Operation

(Continued from page 85)

ly in management. To keep it so is eminently desirable. But to insure its remaining so, will require that the industry better its already enviable record. Federal and State governments and the unions are taking an increasingly greater interest in safety activities and where management lags in its efforts, they have shown an increasing willingness to move in and take over.

If governmental agencies, or the unions, are permitted to have the controlling voice on safety matters, then it becomes exceedingly difficult to keep them out of other operating problems. The entering wedge, for control of the stevedoring industry by others than the management of the company, can well be the assumption of responsibility for enforcement of the safety program by agencies other than management.

True safety is not something that can be enforced from the outside. It must come from within and must be an integral part of operations. Management and supervisors must realize this and must include it in their planning. Safety is one thing from which all parties benefit and they benefit just to the extent that they make it truly effective.

With the end of the war and resumption of peacetime operations, the industry is entering upon a new phase and the resolve on the part of all to make waterfront operations accident free, if followed sincerely, can make future progress much greater than the notable strides which the Marine Industry has made in the past.

TWO NEW, UNUSED 600 HP AT 277 RPM
WASHINGTON DIESEL ENGINES
(With Attached Accessories)
PORT AND STARBOARD
Built in 1944
In Original Crates
IMMEDIATELY AVAILABLE
Readily Convertible for Use in Power Plants, Pumping Stations and Auxiliary Field Units

Marine Diesel engines as manufactured by Washington Iron Works. Model 8-R-18. 600 HP, 277 RPM, 8-cylinder, 4-cycle, 14½" bore x 18" stroke, prs. right- and left-hand rotation, direct reversible, air starting. Height (over-all), 120¼"; width (over-all), 67½"; length (over-all), 295¼". Net weight each (approx.), 80,000 lb. Price for the two $60,000.00, f.o.b. cars Jeffersonville, Indiana. Address: P. O. Box 510, Jeffersonville, Indiana.

A REAL FINE ENGINE READY TO SERVE YOU

Nordberg Announces Its New Diesel Engine

NORDBERG MANUFACTURING COMPANY takes pleasure in announcing the addition of a 9″ x 11½″ series of marine and stationary diesel engines to its present line of engines. By this expansion, the Nordberg Manufacturing Company, well known as builders of quality diesels for a period of 35 years, is now able to offer the same quality type engines in smaller sizes to serve the ever increasing diesel field.

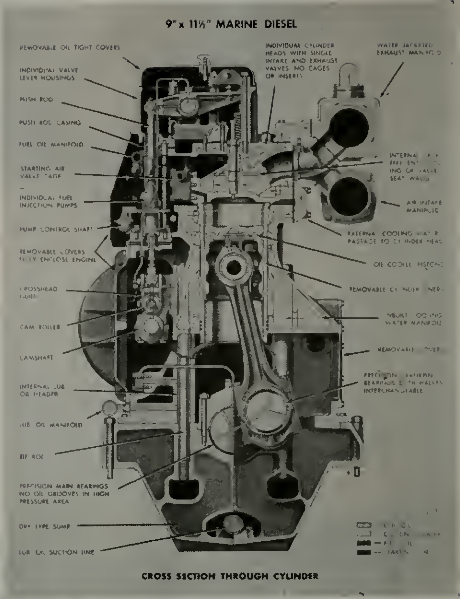
This advanced type diesel series is a four cycle, solid injection engine, having a 9″ bore and 11½″ stroke, and is available in 6, 7 and 8 cylinder models, supercharged or non-supercharged. It is a fully enclosed, heavy duty engine for operation at medium speeds and offers many outstanding design features. Its modern design, simplicity, sturdy construction and accessibility means dependability—the key note of all Nordberg diesel engines.

The engines are available for marine propulsion, marine auxiliary service and stationary installations.

Standard marine engine rating is 50 hp per cylinder at 720 rpm for non-supercharged engines, and 75 hp per cylinder at 720 rpm for supercharged engines. All supercharged models employ the Elliott-Buchi system of turbo-charging.

Marine Engines

The marine diesel models are direct reversing and the entire series especially designed for application to a wide range of craft. All models are available in port or starboard arrangement and for direct or reduction gear drive. For marine propulsion, engine speeds of 600 or 720 rpm are recommended. In-line reduction gears are available in ratios from 2.71 to 4.0 to 1. The reduction gears used on Nordberg engines represent an outstanding development in reduction gear design. They are the In-line planetary type resulting in a compact unit of maximum efficiency, and permitting a lower installation of the engine. A sailing clutch is available to permit operation of the engine for driving of auxiliary equipment through a forward power take-off when the propeller shaft is disengaged.



Cross-section of new diesel engine.

All of the marine models are designed with connections for pilothouse control. The controls are designed to meet the varied requirements of the marine field.

Marine Auxiliary Diesel Generator Sets

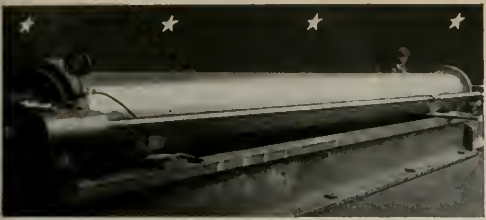
For this class of service, the engine and generator are mounted on a common steel fabricated sub-base forming

(Please turn to page 94)

Approximate Overall Dimensions and Weights of Nordberg 9″ x 11½″ Marine Engines

Model	No. of Cycls.	Height	Width	Direct Drive Length	Direct Drive Weight Lbs.	Reduction Gear Dr. Length	Reduction Gear Dr. Weight Lbs.
FMD-96	6	6′ 8″	4′ 3″	11′ 11¼″	20,000	13′ 10½″	20,500
FMD-97	7	6′ 8″	4′ 3″	13′ ¾″	23,000	15′ 0″	23,500
FMD-98	8	6′ 8″	4′ 3″	13′ 2¼″	26,000	16′ 1½″	26,500
FMD-96-SC	6	6′ 8″	4′ 3″	11′ 11¼″	21,000	13′ 10½″	21,500
FMD-97-SC	7	6′ 8″	4′ 3″	13′ ¾″	24,000	15′ 0″	24,500
FMD-98-SC	8	6′ 8″	4′ 3″	14′ 2¼″	27,000	16′ 1½″	27,500

Many outstanding design features have been incorporated in the new series of engines and the Nordberg Manufacturing Company in adding this series of units to its present line is now in position to serve the smaller engine field and offer a unit of outstanding performance and dependability in keeping with its present line of quality engines.



Merited Leadership

Quality material, superior workmanship and over 30 years experience are the components of every Chief Sandusky Centrifugal Casting.

Ship owners and operators realize the added value of years of experience and specify "Sandusky" on their new construction and repair contracts.

Sandusky has a complete nonferrous centrifugal foundry and machine shop for producing propeller shaft sleeves, stern tube bushings, rudder stock sleeves and pump liners from 3" to 46" in diameter and in lengths up to 347".

Specify Chief Sandusky Centrifugal Castings on your next application.

CHIEF SANDUSKY *CENTRIFUGAL CASTINGS*

SANDUSKY FOUNDRY AND MACHINE CO. SANDUSKY OHIO, U.S.A.

C M LOVSTED & CO., INC., SEATTLE ★ TYNES BROS., BIRMINGHAM, ALA.
CORDES BROS., SAN FRANCISCO AND WILMINGTON, CALIF.

BUILDERS AND REPAIRERS OF SHIPS FOR 42 YEARS

ALBINA

ENGINE AND MACHINE WORKS

PORTLAND, OREGON

LONGVIEW, WASH.

ANOTHER JOSAM MARINE PRODUCT... INVERTED VENT CHECK VALVE!

INVERTED VENT CHECK VALVE
With Hinged Cover
— Series M-400-AC

For venting supply tanks of gasoline or other expanding type fluids.

Float ball prevents water from entering line. Internal screen of fine mesh and heavy external screen, provide protection against flame and clogging by paint or debris.

Stocked regularly, semi-steel galvanized, threaded. Can also furnish black finish. Flanged or welded connections on order.

NOTE! Josam has a full line of:

1. SCUPPER VALVES
2. DECK DRAINS
3. MACOMB STRAINERS
4. AIRPORTS & LIGHTS
5. STUFFING BOXES
6. INVERTED VENT CHECK VALVES

TO HELP BUILD BETTER SHIPS FASTER

JOSAM PACIFIC CO.

765 FOLSOM STREET ★ SAN FRANCISCO, 7
Western Division of Josam Mfg. Co., Cleveland, Ohio

Nordberg Announces Its New Diesel Engine

(Continued from page 92)

a compact unit readily adaptable to a wide range of applications for both ac and dc power generation.

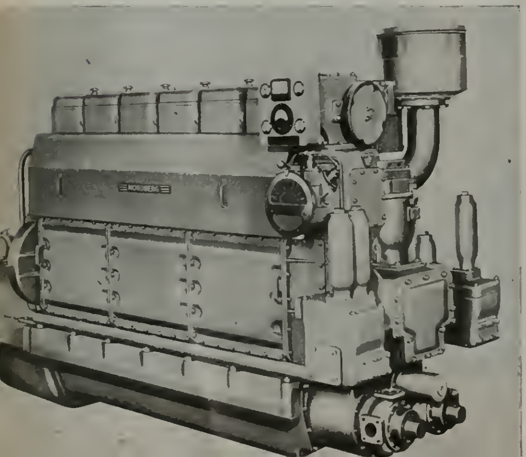
Construction and Design Features

The engine bedplate is a one-piece casting of fine grain high tensile iron extending the length of the engine and serves as the lower half of the crankcase. Heavily ribbed and transverse sections provide rigid support for the crankshaft and bearings. Broad flanges and bosses along the sides provide a rigid means for bolting and securing engine to foundation.

The engine frame is a single casting of alloy iron serving as the upper crankcase and enblock cylinder housing combined, forming a sturdy structure for the mounting of accessories and assuring permanent alignment—the key to dependability. The engine frame is held securely to the bedplate by means of tie rods anchored in the base on either side and below each main bearing and extending to the upper portion of the frame. The tie rods relieve the frame and bedplate of tension stresses set up during the operation of the engine. Large cored areas in the engine frame provide for efficient jacketing and circulation of cooling water. Removable wet type cylinder liners of fine grain cast iron, precision finished, are provided. Neoprene seal rings insure water tight fitting in the engine frame.

Individual cylinder heads cast from heat resisting gray iron alloy are secured to the engine frame with four studs. Combustion chamber is of the open type resulting in efficient combustion and smooth operation. Each cylinder has one intake and one exhaust valve which seat directly in the cylinder head without inserts or cages with resultant improved cooling of the valve seat area. The intake and exhaust valves are of heat resisting and non-corrosive steel with stems chrome plated to provide long life and the top of the valve stem faced with stellite to resist wear. Intake and exhaust valves are identical and interchangeable.

Nordberg marine diesel engine.



Individual valve lever housings cast from fine grain iron are secured to the cylinder heads by means of studs, and contain the valve lever shaft and rocker arm assemblies. Cast aluminum covers are provided fully enclosing the valve lever mechanism and permitting ready access.

Crankshaft is forged from high grade carbon steel with bearing surfaces precision finished and polished and drilled for pressure lubrication from the main to the crankpin journals. Oil holes are located in the minimum pressure zone of the crankpin circumference.

The camshaft is of high carbon steel precision ground and polished with valve and fuel operating cams secured to the shaft and located by keys. Cams are case hardened to provide long life. All timing gears are located at the flywheel end of the engine eliminating undue torsional stress and wear of the camshaft. The camshaft is supported in bearings of cast aluminum alloy secured to the engine frame and pressure lubricated by means of drilled passages from the oil header within the engine frame. The push rods actuating the valve levers are enclosed in a tubular steel casing which fit into the cylinder block. One push rod guide is provided each cylinder and is bolted to the engine frame and so arranged as to serve as a guide for the three individual cam roller crossheads actuating the fuel injection pumps inlet and exhaust valves, respectively. The crosshead assemblies are pressure lubricated through drilled passages from the main engine system.

Individual fuel injection pumps are provided each cylinder. Fuel lines leading to the fuel injectors are short and of uniform length.

The engine is started by compressed air and each cylinder provided with an air starting valve pneumatically opened and closed by an air starting distributor driven from the camshaft. A header connection supplies compressed air to each starting valve. An air starting valve cage is bolted to the side of each cylinder head.

The marine engines, being direct reversing, are equipped with a double set of cams for ahead and astern rotation. During the maneuvering cycle, the cam rollers are automatically lifted from the cams and the camshaft shifted into operating position corresponding to the desired ahead and astern rotation.

Lubrication System

Two lubricating oil pumps of the Tuthill internal gear type are mounted at the forward end of the engine and direct gear driven from the crankshaft. The pumps operate with equal efficiency in either direction. Lubricating oil from the pressure pump is delivered to a lube oil manifold and then to an internal lube oil header which supplies oil to the various parts of the pressure lubrication system. The use of drilled passages from the internal lube oil header reduces the number of oil lines and fittings to a minimum. A special system of rifle drilling of the crankshaft permits continuous lubrication of the main and crankpin bearings without oil grooves in the high pressure area. The reduction gear assembly is also lubri-

(Please turn to page 96)

Seventeen More Vessels Chartered To Philippines

Chartering of additional vessels as an aid to the Philippine Islands' rehabilitation and re-establishment of the interisland trades has been given final approval by the Maritime Commission December 16. Action was taken under the provisions of the Philippine Rehabilitation Act.

Seventeen vessels are included in the present plan. Five C1-M-AV1 and three N3-S-A1 type coastal vessels already under Philippine registry were included as well as three additional N3's not yet transferred. These war-built vessels are to be chartered at 10 per cent per annum of the unadjusted statutory sales price or floor price, whichever is the higher.

The SS Esther Johnson, a prewar vessel, will be chartered at the same rate, based on an estimated value established by the Maritime Commission.

To facilitate bunker fuel oil operations in Manila, the Commission approved the chartering and transferring to Philippine registry of a motor barge and four tankers, all non-war built. The tankers are now laid up in the Islands and will be used only for storage purposes in Manila Bay. This action is expected to speed up the turn-around tankers serving the Bay to expedite the servicing of ships requiring fuel oil, and to aid in the distribution of commercial fuel oil to island industries. It will also reduce the cost of the Navy-maintained service now in effect and relieve the Commission of the expense of caretaking and maintenance of the tankers. The charter rate will be 10 per cent per annum based on an established value.

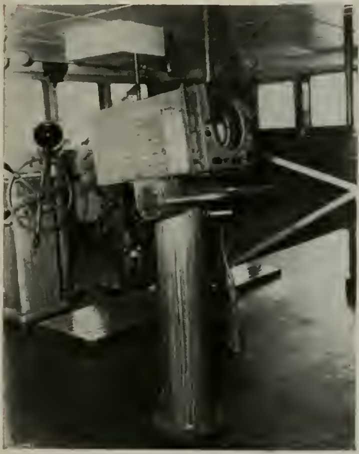
BILGE CLUB

Announces . . .

THE NINETEENTH ANNUAL
BILGE CLUB BANQUET
Saturday Evening • From 6:30 P. M.
FEBRUARY 22, 1947
at
Biltmore Hotel • Los Angeles
Dinner at Seven-Thirty
Followed by Stage Show
Liquid Refreshments Before and After
Admission $7.00 **Formal**
A. F. BORO
President

Raytheon "Pathfinder" On S.S. America

Representing the most modern commercial electronic radar equipment aboard ship, this equipment supplied and installed by the Marine Division of the Mackay Radio and Telegraph Company provides the S. S. America, Queen of the American Merchant Marine, with instantaneous navigational information. Known as "Mariners Pathfinder Radar," this radar installation incorporates all the features of the famous surface-search gear which proved invaluable to the United States Navy during the war. The equipment is designed for minimum range, simplicity of operation and low maintenance essential to merchant marine service. From the scope in the indicator regardless of weather conditions, day or night, objects may be delineated at a range from fifty miles down to a minimum effective range of one hundred yards from the antenna. Arrangement is made within the radar equipment to utilize a feed from the gyro compass system which enables instantaneous position of all objects on the scope to be determined, thereby eliminating the necessity for converting from relative to true bearing. Mackay Radio, an operating subsidiary of the American Cable & Radio Corporation, acts as an authorized sales and service organization within the United States for "Mariners Pathfinder Radar," which is manufactured by the Raytheon Manufacturing Company.



Raytheon's Commercial model of Pathfinder.

Nordberg New Diesel Engine

cated by a branch line from the engine pressure lubrication system.

The piston is cast from heat and wear resisting alloy iron and provided with three compression and two oil control rings. The connecting rod is a high carbon heat treated steel forging designed as an "H" section for uniform column stress in both planes. Rifle drilling provides pressure lubrication to the piston pin of heat treated alloy steel and supplies oil to the jet for oil cooling of the piston.

Cooling Water System

Either reciprocating or centrifugal type sea and fresh water pumps can be provided. The pumps are mounted at the forward end of the engine.

Adjustable Vane Dry Dock Pumps

(Continued from page 43)

was 147 minutes on test, or 8 per cent less time than the 160 minutes called for by the contract.

During a pumping period, as a ship settles on the keel blocks, the discharge may be reduced to as low a rate as desired with all pumps in operation, by using the manual vane control. After the ship is seated on the chocks, changing to automatic control increases the pumping rate to full capacity again.

When the water is lowered to about two feet above the dock floor, all pumps are kept in operation, but the rate is automatically reduced, so as not to draw the water into the intake faster than it can flow from the upper end of the dock. Toward the last, the vane position is maintained so that the level in the suction pits is about two feet below the floor of the dock. This level can be held with ease and the water is fed to the pumps by the subsurface drainage system. The pumps can be kept in operation long enough to pump the floor practically dry, without drawing air into them intermittently and causing excessive vibration.

These two installations present a new approach to the problem of pumping large quantities of water under extreme variation of head. The adjustable vane pump can benefit from the large submergence at the start of the pumping period and discharge more water when the head is low by opening the impeller vanes. It can overcome the cavitation difficulty at the end of the pumping period when the head is high by reducing the vane pitch. By changing the vane position, the further advantage is realized of maintaining a constant load on the motor and therefore using it to full capacity over the entire range.

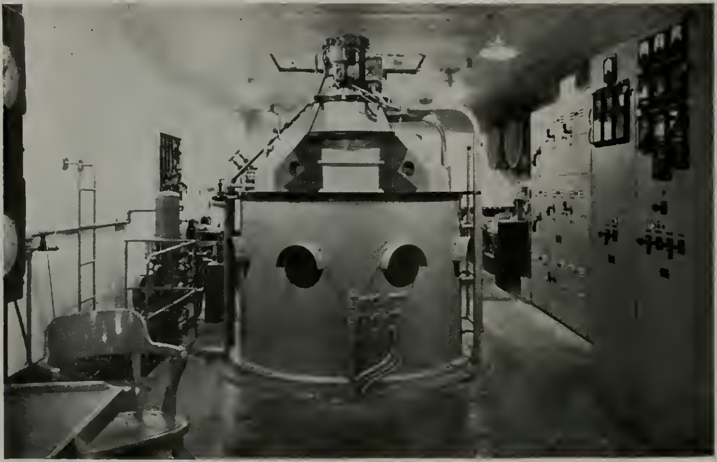
While this was not the first adjustable vane pump and many more have been built since this installation was made, there were new problems involved in connection with the design of the motors and their controls, the solution of which was successfully accomplished by the Engineers of the General Electric Company working in close cooperation with the S. Morgan Smith Company.

Book Review

AMERICAN MERCHANT SEAMAN'S MANUAL, by Felix M. Cornell and Allan C. Hoffman, 834 pages with numerous tables, diagrams, drawings and illustrations, bound in navy blue buckram with gold stampings. Published by Cornell Maritime Press, New York. Price $4.50 net.

This is a fourth revised and enlarged edition of the hand-book that is used as a standard text in all Maritime Service Training Schools.

By the use of this book, the sailor can prepare himself for his A. B. and Lifeboat certificates, and continue his studies in navigation stability, first aid and other subjects until he is ready for his mate's license.



Main pump motor room at Hunter's Point Dry Dock No. 4.

The Marine Boiler

(Continued from page 66)

from clean metal surface to water, 166; from scale coating No. 2 to water, 67; and from scale coating No. 3 to water, 31.

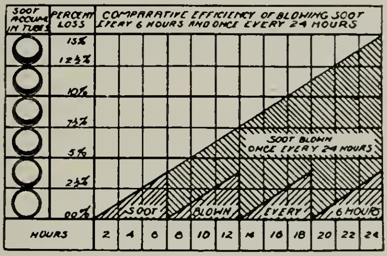
To keep tubes clean the principal cure is treatment of feed water to remove or alter scale forming dissolved solids or suspended matter. This treatment will be given thorough overhaul in future installments in this series. To remove scale coatings already formed, any one of several commercial tube cleaners should be used and the best practice is to completely clean all the inner surfaces of the boiler, economizer, and superheater tubes, at least twice in the first year of service and once a year thereafter. Tube cleaners are of two types (1) hammer and (2) cutter. The former works by a series of rapid blows on the scale, the latter cuts or wire brushes the scale off the tube surface. Commercial types are available with compressed air, steam or water drives. A rise in stack gas temperatures is usually an indication of scale or soot deposits.

Soot

The term soot as used in reference to boiler room practice is not confined to "lamp black" or carbon deposits. In a modern water tube boiler almost any deposit of fine material on the outside of the tubes is known as soot. Hence tubes do not have to be black to be sooty. The deposit may range from gray, green, red, and brown to white.

Soot deposits are formed in all boiler installations no matter what fuel is used and the majority of marine boilers are now installed with soot blowers built in and connected to the steam lines so that a very simple adjustment and a few minutes operation of the blowers cleans the deposit off the tubes and sends it up the stack. This operation should be done at least once daily on a boiler in service. This is a prime necessity even when there is perfect combustion.

Tests on a new and perfectly clean boiler installation at a large electric plant show the uptake temperatures on the first day of operation averaging 550°F. and on the fifth day rising to an average of 650°F. all due to soot deposit. This meant an increase of 5 per cent in fuel consumption. Other experiments have shown that a change from blowing once in 24 hours to blowing every six hours resulted in lowering fuel consumption by 4 per cent.



Effect of interval between soot blowings.

A very important point to keep in mind when using the mechanical soot blowers installed in the boiler is that the steam line to each blower should be thoroughly drained before using the blower. Moisture cakes the soot deposits and makes them cling to the tubes to be baked on and thus form a very efficient and hard to remove insulator.

Failure to properly use soot blowers will rapidly bring the boiler tubes to a condition where complete breakdown may be expected.

(To be continued)

Mineral Fiber Insulation and Textiles for Marine Service

(Continued from page 50)

reason of the light weight of the insulation plus the fact that the fibrous nature of the insulation allows it to be punctured—the result provides a satisfactory installation at low cost; the flexibility of the bat assures close fitting to the plate surface.

For machinery space and quarters insulation without a metal sheathing finish, present practice is as follows: Studs are welded to the ship plates in patterns to coincide with the size of the insulation sheets. Next, rustproofing coating is applied over welded surfaces and then, with back cemented and edges buttered, the rigid fibrous glass sheet with hardened cloth facing is impaled over the studs and then fastening clips or washers are set in place. Seams, when necessary, are caulked with fireproof cement and the joints are taped with fibrous glass tape prior to any finish paint coat.

The specification described last above eliminates most of the difficulties previously encountered in the application and service life of a glass cloth-faced marine insulating board. Previous difficulties with shoring of cemented sheets are eliminated; chances of rusting of stud welds and of poor welds are practically eliminated; puncture of the exposed cloth facing is minimized; denting of the insulation sheet with subsequent exposed surface deformation is minimized; vibration of and sifting of particles from sheets in service are practically eliminated.

In the case of refrigerated spaces, the desirability of the extensive use of wood framing in connection with the installation of light weight mineral fiber sheets has been questioned. Many satisfactory installations have been made with metal framing and using laminated plastic spacers and blocks between steel members.

Installations at reasonable costs using rigid mineral fiber sheets, V-notched and hinged by the facing cloth, for wrap-around installation on ducts appear practical against other types of insulating material.

Application methods for sound absorbing materials have been in many cases those already used in building construction, though the confined spaces and irregular surfaces common aboard ship and which are to be treated call for considerable experience and mechanical ability to have these products installed to give maximum treatment and neat finished appearance.

Satisfactory installation procedure for working with amosite felt has been worked out. In general, the material is wet down and compressed to about twice its natural density prior to insertion in a pre-fabricated insulating pad. Cutting of the material and electrically-driven cutting knives is standard practice.

Application of asbestos cloth about pipe lagging and fittings has presented no difficulties. In some cases wetting the cloth has resulted in a slight shrinkage on drying so that the cloth has a very tight fit over the lagging. Sewing of the cloth with fine copper wire, or asbestos cord, or treated fibrous glass cordage is satisfactory.

Application of fibrous glass cloths and tapes has been satisfactory in some cases; in others, difficulties have been encountered. Tape is generally applied by spiralling same about the pipe, securing the ends with a fireproof adhesive cement or with staples; subsequent painting strikes through the fabric and produces a good set. Savings in man-hours by spiralling lagging tape in lieu of sewing over fitting cloth have been very considerable. Sewing of the plain untreated cloth with large threads and considerable tension applied has caused threads in the warp or fill to pull out of position. A light vinyl treatment to the cloth has minimized this condition and has likewise imparted additional abrasion resistance to the cloth. The fibrous glass cloth has no shrinkage and for this reason will not draw up drum tight after wetting or after painting.

Plain and varnished Fiberglas tubing, tapes, cloths, and cords have been used by all shipyards and by "E" Division, or its equivalent, aboard ship. Reports of application and service results for the materials indicate a high degree of satisfaction.

The use of Fiberglas-melamine panelboard aboard ship has resulted in very few installation difficulties. This material is apparently best cut by carbide-tipped tools, and in cases where considerable dust is found, cutting under water or with a good fan exhausting kerfed material is desirable.

The use of fibrous glass portieres has brought about improvements in the products. Under extreme humidity conditions, it has been found that cloths have exhibited broken threads at points of flexure. Special coatings (in extremely thin layers) have been applied to the yarns and cloths for eliminating this difficulty.

From the foregoing it is evident that mineral fibers have been relatively important materials in the construction of ships in the past ten years. Also, it is apparent that, from basic characteristics possessed, various styles and types and modifications of these products will continue to be used as worthwhile additions to the materials available for building ships in the future. It is also desirable to survey how these recently developed products are measuring up at present.

Since a mineral fiber lightweight bat quarters insulation two inches thick is now available at an installed cost approximately half that of one inch of vegetable fiber board used previously, and since the materials are fireproof, and are not damaged by moisture or fungus, this material should remain as a standard material for this purpose. Also, since greater emphasis must be placed on comfort of hired personnel aboard ship, as well as of passengers (who are also potential airline passengers) the continued effective use of this material is indicated.

Possibilities of considerable savings in weight and thus the gaining of worthwhile revenues on the part of merchant ships has been recently emphasized by Mr. Heaney, in which he points out that the use of lightweight insulation for refrigerated, machinery, and galley spaces and sound deadening areas could result in increasing the revenue earning ability of a 500-foot cargo-passenger vessel $500,000 in twenty years.

On fighting craft the use of a hardened-cloth faced material which bears an estimated installed cost of less than half that of lightweight bats plus metal sheathing while at the same time allowing access to pipes, cables, etc., has the appearance of a continuing program. It is

(Please turn to page 100)

Mineral Fiber Insulation

(Continued from page 98)

to be noted that under most conditions the impact strength of the hardened cloth is such that, after being struck a blow, no evidence of a blow is shown, whereas the same type of blow on light gage metal would cause a permanent dent.

It is hoped that advances made in the aircraft field indicating the advantages of septum cloths will improve the sound deadening efficiencies of future installations of sound absorbing materials in marine service.

The use of mineral fiber sheets as duct insulation aboard ship in place of such products as asbestos corrugated paper forms has been apparently satisfactory. Lightness in weight and lower thermal loss even when using lesser thicknesses indicate the material is worthwhile from deadweight standpoint.

From a fireproof standpoint it is believed that some form of fibrous glass or combination fibrous glass and asbestos textile will be used as fireproof portieres on fighting ships and as fireproof curtains and drapes aboard merchant ships. Many colors and patterns of these products are now available.

Asbestos textiles and amosite asbestos fiber filler in removable pipe fitting pads will undoubtedly continue to be used for pipe lagging work. In some cases combination fibrous glass and asbestos textiles have proven to be more advantageous than either of the single type yarn textiles.

Fibrous glass used in electrical equipment give every indication of being the standard fabric for marine equipment by reason of its high strength vs. weight ratio and its resistance, especially when combined with the newer silicone resins, to moisture penetration.

The fibrous glass cloth-melamine resin laminates give every indication of providing an extremely strong board for panels which will possess high arc-resistance and can, on new installations, save up to 75 per cent of the weight over previously used boards—the average tensile, compressive, and impact strengths being over three times that of the best cloth-base phenolics. In addition, of course, a minimum of toxic fumes is given off should the surrounding area be ignited.

Around The Yard . . . . With Kolb

"I don't care if it is faster than the torch. You make the edges of the steel so ragged!"
Through the courtesy of Ingalls News

New Speedy Auto-Passenger Liner

(Continued from page 64)

morning, largely as an auto-ferry, and then run back to Seattle, arriving in plenty of time to make ready for that night's trip. The run is a little over 100 miles each way. It is the favorite route for touring and business cars to Victoria and Vancouver Island.

The Puget Sound Navigation Company has consistently improved its service to the key cities of northwest Washington and is today the dominant factor in marine transportation on the great stretches of inland waters composing Puget Sound and its tributaries. As now organized this firm is managed by the following executives:

Lawrence Bogle, chairman of the board; Captain Alex M. Peabody, president; Captain Harry I. Anderson, vice president and operation manager; C. R. Lonergan, vice president and traffic manager; I. D. Birse, general freight and passenger agent; H. C. Strassburger, secretary-treasurer; E. W. Peabody, marine superintendent; and Neil McCullough, port engineer.

These men are all veterans in Puget Sound traffic and are operating the many vessels under their care with efficiency and with great satisfaction to their many patrons.

Foreign Market is Vital

(Continued from page 58)

firms to take advantage of foreign trade possibilities "far in excess of prewar markets."

Mr. Gifford first became associated with the Borg-Warner Corp. in 1931 as assistant to the president. Mr. Gifford organized the Norge export department in 1933 and the Borg-Warner International Corp. in 1934. In 1940 he became vice president of Norge and Detroit Gear, both divisions of Borg-Warner. An outstanding authority on international trade, Mr. Gifford is a world traveler who has crossed the Atlantic Ocean more than 40 times. He estimates he has spent a total of more than a year and a third on ocean liners.

MARINE MARKETING CO.

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J. H. (Jack) SEDERLUND

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AMERICAN REPUBLICS LINE

Freight and Passenger Service between the East Coast of United States and the countries of

BRAZIL · URUGUAY · ARGENTINA

PACIFIC REPUBLICS LINE

Freight and Passenger Service between the West Coast of United States and the countries of

BRAZIL · URUGUAY · ARGENTINA

AMERICAN SCANTIC LINE

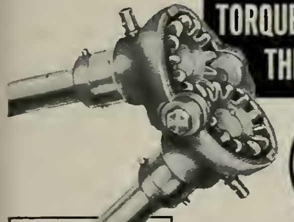
Freight and Passenger Service between the East Coast of United States and the countries of

NORWAY POLAND
DENMARK FINLAND
SWEDEN RUSSIA

From Pearl Harbor to V-J Day, Moore-McCormack Lines operated more than 150 ships, lost 11 vessels, transported 754,239 troops and carried 34,410,111 tons of war cargo. To discharge such responsibilities in time of crisis, America's Merchant Marine must be kept strong in peace —as in war.

For complete information apply

MOORE-McCORMACK LINES
5 Broadway, New York 4, N. Y.
Offices in Principal Cities of the World



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In a recent nation-wide survey, users were asked to comment on rotary pumps in use. Many fine compliments concerning the simplicity, ruggedness and dependability of Viking Rotary Pumps were received. "Vikings extremely satisfactory on heavy work," one user reported. "Of all the pumps we have (and there are a great many) we like Vikings best" another said. "Viking is the best pump for our service. Buy nothing else," still another said. "Vikings do a wonderful job. Don't know what we would do without them," another said.

For complete information on Viking Rotary Pumps, write today for Bulletin Series 46SU. It will be sent free by return mail.

See Our Catalog In SWEETS

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Export Managers' New Officers for 1947

At the last regular meeting of the Export Managers Association of San Francisco held January 10, 1947, the following officers were elected to serve during the current calendar year:

President—Joe Marias, president Associated Commercial Co., 24 California Street, San Francisco; vice president—Victor A. Indig, export manager, American Rubber Manufacturing Co., 210 Post Street, San Francisco; secretary—A. E. Ojeda, special representative, Foreign Trade Department, Standard Oil Co. of California, 225 Bush Street, San Francisco; treasurer—D. M. Mari, export manager, Fibreboard Products, Inc., Russ Building, San Francisco.


J. F. Marias

APL Man Heads Chinese C of C

P. C. Quock, General Chinese Agent for American President Lines with headquarters in San Francisco, has been elected President of the San Francisco Chinese Chamber of Commerce for the year 1947.

Mr. Quock, who was reared and educated in San Francisco, succeeds K. L. Kwong, manager of the Bank of Cantón, who was the Chamber's President during 1946.

Mr. Quock was only recently appointed by President Henry F. Grady as President Line's General Chinese Agent in charge of both Chinese freight and passenger traffic throughout the United States.

Fidelity Gets George Davis

E. George Davis, for years manager of the Argentine Trade Promotion Corporation, has been appointed manager of the Latin American Department of the Fidelity Trading Co., Inc., San Francisco. Davis is a leading member of the foreign trade fraternity on the West Coast and has participated in the planning of many forward-looking projects. He will be leaving shortly on a tour of the countries to the South.

Gateway to Victory

By Captain James W. Hamilton and

First Lieutenant William J. Bolce, Jr.

with Foreword
by General Douglas MacArthur

The complete, authentic, behind-the-scenes story of the San Francisco Port of Embarkation in World War II is told by two officers who served at the port for many of its eventful months.

Prefaced with a history of the port from Spanish days, Gateway to Victory details the spectacular growth of the port after Pearl Harbor, its quickening activity and gearing to full speed for the height of the war. It takes you through the war's end, the return of soldiers through the Golden Gate, and the slowing down of activity in adjustment to peacetime service to nation and community.

Interwoven with chapters describing the key activities of the port are the background chapters telling about other equally facinating activities. The suspense and drama of Intelligence work, the work of the morale-building units, the story played by civilian and private industry, including such key San Franciscans as John E. Cushing, Lewis A. Lapham, Frazer Bailey; and biographies of commanding officers.

More than 40 full page pictures provided by the U. S. Signal Corps are featured showing many phases of the dramatic battle of supply, revealed in book form by two men who have been intimately connected with what went on in San Francisco.

The Approved All-Purpose Distress Signal

A·P DAYNITE DISTRESS SIGNAL

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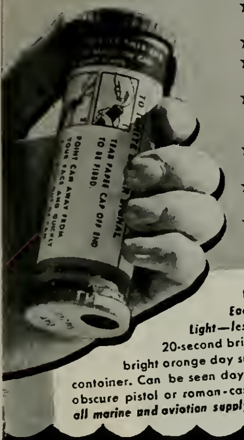
1,500,000 NOW BEING MADE FOR ARMED FORCES



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Hand held. Safe. Dependable. *Each signal absolutely watertight. Light—less than 7 oz. Compact—5⅛ long.* 20-second brilliant night flare plus 18-second bright orange day smoke in opposite ends of steel container. Can be seen day or night when overcast would obscure pistol or roman-candle type signals. *Available at all marine and aviation supply dealers. Accept no substitutes.*

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Former Navy Vessels Suitable for Cargo-Displacement from 400 to 4100 tons

▲ *Diesel Engines*

225, 900, 1800 Horsepower

▲ *Generators*

Diesel powered 20, 30, 100, 200 kw

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▲ *Lineshafts-New*

Forging Quality 16" OD x 22'2" Long

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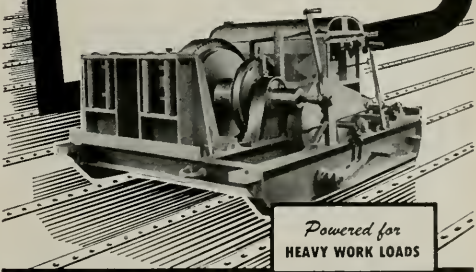
● Eliminates use of ship's gear in spotting heavy loads. Four speed transmission, 39 B.H.P. Weighs approximately 6000 lbs. Easily moved from one ship to another. Drum capacity (each drum) 400 feet of ¾" wire rope. Drum speed 45 down to 6 R.P.M.'s. Quiet, cut tooth spur and pinion gears. Write factory for complete details and individual requirements.



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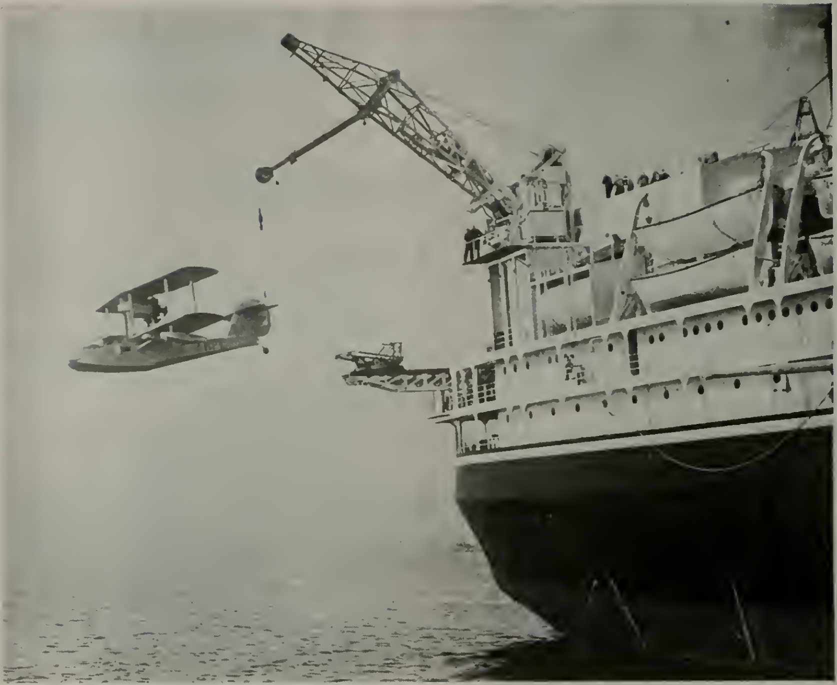

Plane after leaving catapult on the Balaena.

Whaling De Luxe

THE ANCIENT ART of whaling as practiced in sailing ship days has long disappeared from the sea. In its place, there has emerged a modern application of engineering and scientific techniques that give the poor cetacean no sporting chance.

Latest and among the largest whale factory ships to join the whale destruction parade is Balaena, built and recently delivered by Harland and Wolff, Ltd., of Belfast, for United Whalers, Ltd. This vessel will act as a mother ship for ten whalecatchers, and carries three amphibian planes (Naval Walruses) in a special hangar arranged so that each of these planes can be run out onto a catapult and driven off the ship at sufficient speed to become airborne immediately. These planes are used for spotting whales and for scouting weather and ice conditions.

She is a very large hull, with the following characteristics:

Characteristics

Length B. P.	**535′ 0″**
Beam Mld. tank Dk.	**74′ 0″**
Beam Mld. above tank Dk.	**77′ 0″**
Depth Mld. tank Dk.	**35′ 0″**
Depth Mld. Flensing Dk.	**57′ 0″**
Displacement approx.	**32,000 tons**
Gross measurement	**15,000 tons**
Net measurement	**7,200 tons**
Deadweight capacity	**21,000 tons**

She was built under Lloyd's special survey for highest class for vessels carrying bulk oil of flash point above 150° F. Her hull is of the two deck type with open bridge, forecastle, and poop erections.

The upper, or flensing deck, has a clear area for handling whale carcasses, of 321′ 6″ length and 77′ width. On this deck, for handling the whales, are installed: 9 ten-ton derricks; 4 five-ton derricks; 16 steam

(Please turn to page 106)

For steel—
call Jorgensen first
JORGENSEN STEEL
OAKLAND SAN FRANCISCO LOS ANGELES HOUSTON

winches; 9 electric winches; 10 warping capstans; 2 forty-ton winches for hauling whales up the slipway; and 4 steam saws for cutting up whale bones.

The Factory Plant

On the tank deck is the factory space, 375′ long, 77′ wide and 22′ high, with an intermediate flat 7 feet above the tank deck extending over a large part of the space. Most of the machinery is located on this flat and comprises: 22 pressure boilers for treating bone; 10 pressure boilers for treating blubber; 8 Kraerner type rotating digesters; a liver extraction plant; a meat meal plant; and a separator plant.

A conveyor belt runs the full length of the factory space and connects with an elevator forward and aft, for discharging finished products to ships alongside. A quick freezing plant is installed to freeze the choicest parts of the whale meat which are then stored in refrigerated chambers aboard, or transferred to a refrigerated vessel. Quite a market has been developed for whale fillet among European gourmets.

Consumption of fresh water in the processing is very large and three triple effect evaporating and distilling plants are installed with a combined capacity of 750 tons fresh water per day. In addition, 2240 tons of fresh water can be carried in deep tanks forward.

The main cargo tanks have a capacity of about 19,150 tons of oil. On the outward voyage these are filled with fuel oil. As this oil is gradually consumed by the ship's boilers and the whale catchers' engines, these tanks are steamed out clean and filled with whale oil.

Propulsion Machinery

Propulsion machinery is fitted aft. Seven multi-tubular single-ended scotch marine boilers, fitted with combustion chamber superheaters, and burning fuel oil, supply steam at 220 psi to two direct acting triple expansion reciprocating steam engines of the re-heat type, each of which generates 4000 ihp. All the usual auxiliaries for such a plant are fitted, most of them electric drive. The uptakes from the boilers are led into two stacks, one port, one starboard, to allow a clear runway for hauling whales onto flensing deck. Auxiliary power is provided by a group of generating sets all delivering power to the main switchboard at 220 volts dc. There are four sets: one a steam turbine unit of 1500 kw capacity; two diesel engine sets, each of 300 kw capacity; and a steam driven set of 72 kw rating. Since practically every moving part in the factory is driven by electricity, there are 300 motors connected to the switchboard ranging in capacity from ½ to 130 hp.

Three engineer's work shops, an electrical shop, a blacksmith shop, and a carpenter's shop are fully equipped with all necessary tools and are located to best serve the maintenance of the factory, the propulsion machinery, the sea planes, and the whale catchers.

Navigation

The bridge is equipped with all the latest devices that have proven themselves in navigation. These include: gyro compass, short and long wave wireless, two systems of wireless telephony, direction indicator, electric log and two systems of radar. Inter-communicating telephones, alarm and call bells, staff locating system, electric clocks and loud hailers are also fitted.

Accommodations

This vessel has to take care not only of her crew, but also of the crews of whale catchers and the factory personnel, including manager, chemists, and bookkeepers.

(Please turn to page 108)

Hatchway through which whales are transported to the flensing deck.
◄

View of the Separator Room.
▼

TOUMEY **ELECTRIC & ENGINEERING CO.**

Representing BENDIX MARINE PRODUCTS CO.
Successors to CHAS. CORY CORPORATION
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Signaling, Communicating and Lighting Equipment
PNEUMATIC CORPORATION (New York)
Gauges: Liquid Level, Ships Draft, Pressure, Boiler Water Level
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Shipping Copper Assures 18 to 24 months

It's the Leaching Rate that Tells the Story

"All anti-fouling compositions have a limited 'life' which varies from 4 to 12 months," said British authorities in 1945. Before that year ended, U. S. government research developed new principles of formulation for anti-fouling paint which enabled American fighting ships to remain in prolific fouling waters of the Pacific from 18 to 36 months.

SHIPPING COPPER formulated on these same principles by Manning-Mitchell staff members who were key men in the government research program, withstands the same severe test. This is proved by actual use at sea as well as by laboratory tests which certify a constant leaching rate in excess of 10. And operators who use SHIPPING COPPER save $5,000 to $40,000 per ship.

MANNING-MITCHELL, INC. • 500 2ND ST., SAN FRANCISCO 7, CALIF.

MANNING MITCHELL product

Whaling De Luxe

(*Continued from page 106*)

This adds up to a total of over 400 persons and the total accommodation provided is:

In single berth cabins	24
In double berth cabins	198
In three berth cabins	6
In four berth cabins	204
In six berth cabins	12
Total	444

These cabins are arranged in the deck houses, along the outboard sides of the factory flats, and below the flensing deck forward of the factory space. Fifty-one bath rooms are provided.

Large capacity for refrigerated galley stores, extensive galley equipment, and spacious mess rooms are provided to take care of this large complement.

With this equipment after him, Moby Dick has only one chance of escaping the bomb harpoon, the flensing knives and the pressure cookers—he can sound and stay sounded—but before doing so we are sure if he were endowed with speech his last words would be, "This is not cricket."

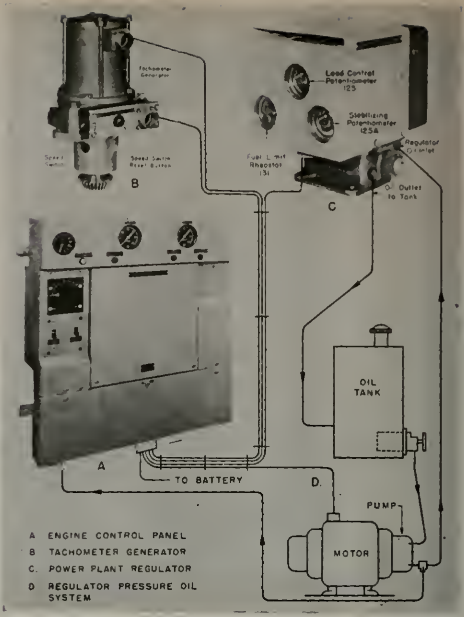
New G-E Electro-Hydraulic Control System for Diesel-Electric Drives

A new electro-hydraulic governing system for diesel-electric drives, readily adaptable for ship propulsion, locomotives, mobile and stationary power plants, oil well drilling rigs, and industrial uses where diesel-electric drives are employed, has been developed by the General Electric Company.

Speed measurement is performed by an engine-driven ac tachometer generator whose output voltage is proportional to speed. Speed is maintained at pre-set values, by feeding the speed indication to a hydraulic servo-mechanism which controls the engine fuel and generator excitation, and makes possible full utilization of the engine without danger of overloading.

Engine protection safety features are built in this new governing system. Overspeed protection is provided by an overspeed trip switch which automatically cuts off the fuel supply when the engine overspeeds. If the engine lubricating oil pressure drops to the danger level, a short-circuiting switch drops the engine speed automatically to idle. Similar type switches, functioning with the same end result, operate at dangerously high temperatures or on occurrence of a ground in the main power circuit.

Remote control in this system is readily achieved. The manual and automatic controls may be located at any desired distance from the prime mover. Speed modulation can be infinite or by definite steps as in throttle notches. The engine-speed indicator is remote from the fuel control. Multiple-unit operation, as in the case of diesel-electric locomotives, is readily accomplished.



General Electric power plant regulating system.

National Marine Exposition Attracts Nationwide Interest

Roger E. Montgomery, general manager of the annual National Marine Exposition, announces that, to date, over fifty nationally prominent manufacturers and outstanding distributors from ten states have contracted for space in which to exhibit their marine products and services to the thousands of buyers and other interested persons who will throng the San Francisco Civic Auditorium next May 12 to 17. The second annual National Marine Exposition, sponsored by the Propeller Club of the United States, brings to the Pacific Coast its *first* National Marine Exposition on that date.

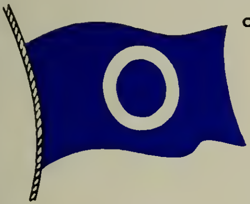
Pacific
MARINE
REVIEW

MARCH 1947

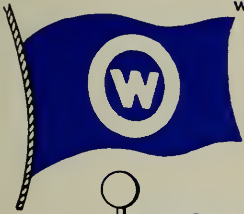
Know Your House Flags

Flying above ships which have their home ports on the Pacific Coast are the house flags of some of America's leading steamship companies. This is the first of a series giving brief histories of the flags and their owners.

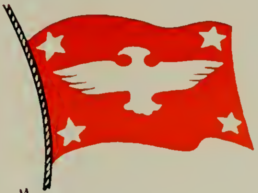
General Petroleum Corporation and other Socony-Vacuum companies supply Gargoyle marine oils, and lubrication engineering service, to these outstanding shipping firms . . . and to most of America's maritime companies . . . in more than three hundred ports throughout the world.



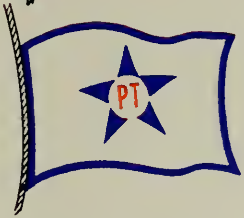
OLIVER J. OLSON & CO.
For sixty years the white "O" has been the symbol of the Olson interests. The background was formerly green, but blue was adopted in 1923 because Olson felt it was the color most typical of strong maritime nations.



WEYERHAEUSER STEAMSHIP COMPANY
Founded in 1933, the company used an ornamental "W" on its original flag. Ten years later the emblem was modified to the simpler and more attractive design which now appears on the Weyerhaeuser flags and stacks.



AMERICAN PRESIDENT LINES
Four stars were added to their house flag in 1916, when they were made a part of President Wilson's flag. This was in keeping with naming of their ships for the Presidents of the U.S. The eagle symbolizes power.



POPE & TALBOT LINES
For 96 years the circle "M" symbolized the McCormick Steamship Company. In 1943, the name of the firm was changed and at the same time the "M" was replaced by the "PT."

SOCONY-VACUUM OIL CO., INC.
According to mythology, Pegasus was born when Perseus killed the snake-haired goddess Medusa, and her blood united with the spirit of the sea. The fabulous winged horse was later tamed by Bellerophon and they performed prodigious feats together. As a trade mark, the Flying Red Horse was first introduced in the Orient, where symbols are often used instead of trade names, and later became the feature of the house flag. The Gargoyle, too, was first used abroad, and is now known all over the world as the symbol of outstanding petroleum products and lubrication service.

GENERAL PETROLEUM CORPORATION
(A Socony-Vacuum Company)

GARGOYLE Lubricants

GARGOYLE

MARINE OILS AND ENGINEERING SERVICE

MEN and ROPE

Tony Camilleri, 34 years with Tubbs Cordage Company, operates the modern Gill fiber spinner.

Good rope starts with the very growing, selection and grading of the fiber. Then the rope making job is taken over by modern, precision machines that convert, step by step, the raw fiber into the finished rope product.

But in every stage of manufacture, there must be MEN—men skilled in the art of fine rope making to operate these machines, continually check each step, to assure a finished rope product that will deliver the maximum in wear and dependability.

With a background of nearly a century of fine rope making, it is this combination of MEN and ROPE that has kept the Tubbs rope trademarks the leaders in their field, that assures you **EXTRA** rope value when you specify TUBBS to your supplier.

TUBBS
EXTRA SUPERIOR MANILA
CORDAGE COMPANY

MANILA ROPE IS BACK!

Manila rope is now available in ALL SIZES, FOR ALL END USES. However, Tubbs Extra Superior Manila will not be available until the required quantities and grades of Manila fiber are once more available.

TUBBS CORDAGE COMPANY

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By B. H. Boynton

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PURE MANILA ROPE

Pacific MARINE REVIEW

Our Defenses Are Threatened

THE HEROIC ACCOMPLISHMENTS OF THE WAR are but faint memories to a great many people. We wish they could be preserved in the hearts and minds of all, and if a way can be found to effect this result it will be worth all it costs in dollars for there are those who would cultivate forgetfulness. Warnings should constantly be flown against the undermining critics and influences which strike at the country's defenses in one way or another, and included in those forces is merchant shipping.

The economizers who say give them sixty cents when they need a dollar; the commentators who blast reputations to win personal prominence or to further a selfish cause; the self-styled intelligencia that would place world theory above national security; the interests which would, as in San Francisco, displace the Presidio big gun emplacements and the Army hospital expansion to further a real estate project; and those who fail to remember the importance of the Merchant Marine in war and peace—the intent may vary but the result is the same.

The Merchant Marine! All its ships were taken and but few returned, and there are times when on all the million miles of the Atlantic and Pacific there is scarcely an American passenger ship at sea. Our shipyards are closing up.

Gentlemen of the Commissions and the Congress and the Unions, what are you thinking of? Is peace so sweet that war's havoc cannot be remembered? Is the wide blue ocean so beautiful that you would not dot it with American ships—even as a safety measure? Are our shipyards to lose their skill and our seamen their ships for economy's sake? Have we been infected with internationalism to the extent that we prefer to see our foreign friends divert our business, our employment, and our security? Let us find a way and a loud voice to tell our people that we can only feel safe when we have the best in all defensive fields. Old Liberty hulls up the creek do not constitute the world's best Merchant Marine.

E Pluribus Unum

OUR NATIONAL MOTTO of union is a slogan much needed today in American Merchant Marine circles. It is becoming more apparent daily that we are drifting into the same national policy with regard to shipping that has made us a very third rate seagoing power in peacetime commercial maritime business, during a very large proportion of our history.

Today we have the largest merchant fleet ever assembled under one flag. Today as ever before we have that fleet shackled in its conversion to peacetime use by government red tape. Overlapping Federal regulatory bureaus, lack of agreement among shipping executives, lack of cooperation from union maritime labor and lack of understanding among our legislators.

Many drastic laws and regulations have been imposed on the American Merchant Marine to protect the American seafaring passenger. These laws make it imperative to raise passenger fares in order to meet the extra costs imposed by the law. This drives more American passengers to foreign flag ships where the protective law does not apply. Hence the law becomes simply a handicap on the American Merchant Marine.

W. E. Spofford of the U. S. Maritime Commission in a recent address before the New York Metropolitan section of the Society of Naval Architects and Marine Engineers, after analyzing this situation declared as his conclusion:

> "It is my candid opinion that our merchant marine will never be on an efficient, effective or permanent basis until the following conditions have been met:
>
> (1) Unity of purpose and effort by steamship operators, shipbuilders and vendors.
>
> (2) Consolidation of all Governmental agencies regulating shipbuilding and ship operation.
>
> (3) Simplification and codification of all U. S. Governmental maritime laws and regulations."

We thoroughly agree with the addition of marine labor as one of the principal factors that must achieve "unity of purpose and effort." As Mr. Spofford says very eloquently in his final paragraph:

> "Maritime laws and regulations are made not alone to safeguard human life and property. They should be framed to provide freedom of international commerce, and at the same time, preserve our national integrity and security."

SHIPS NEEDED

American President

CERTAINLY ONE OF THE MOST FAMED SHIPPING SERVICES ON THE PACIFIC IS THE ROUND-THE-WORLD SERVICE OF THE AMERICAN PRESIDENT LINES. DURING THE 16 YEARS OF OPERATION PRIOR TO THE WAR, IT TRANSPORTED MORE THAN 110,000 PASSENGERS AND 5,500,000 TONS OF REVENUE CARGO. THESE FIGURES, JUST AS FIGURES, REPRESENT A NOTABLE PROPORTION OF AMERICAN TRADE AND TRAVEL DURING THE PERIOD. TRADE AND TRAVEL ON THIS ROUTE IS MORE IMPORTANT THAN A SIMILAR VOLUME ON MOST OTHER ROUTES, FOR SEVERAL VITAL REASONS; BUT LACK OF SHIPS HAS HALTED PROGRESS HERE.

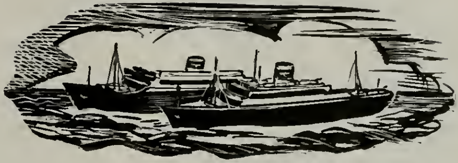
BEFORE THE WAR, THE ROUND-THE-WORLD FLEET CONSISTED OF 14 AVAILABLE SHIPS, WITH SEVEN IN CONSTANT SERVICE.

ALL OF THE SHIPS WERE TAKEN OVER FOR USE BY THE ARMED FORCES, AND THE CONTRIBUTION THEY MADE TO SUCCESS IS WELL KNOWN. THE EFFECT ON THE ROUND-THE-WORLD FLEET IS NOT SO WELL KNOWN. ONLY TWO SHIPS ARE LEFT.

PREWAR—14 SHIPS WERE AVAILABLE

FOR ROUND-THE-WORLD

Line's Plans Ready



POSTWAR—TWO SHIPS WERE LEFT

OBVIOUSLY THIS NUMBER OF SHIPS IS WHOLLY INADEQUATE to maintain even prewar service, and the postwar demand is far beyond the prewar figures for both passenger and freight. The Company's government contract covering this essential Round-the-World Service specified employment of the minimum of seven ships. However, in the prewar process of modernizing the fleet, the replaced older liners were diverted to other trades but still remained available to Round-the-World service if and when needed. With a passenger backlog of 14,000 for Orient points and upwards of 1000 for the Round-the-World run prior to any scheduled sailings, and with Matson using an unconverted C-4 troop transport to carry maximum loads to Australia, travel across the Pacific is a long way from normal.

The public is exceedingly anxious to travel the Pacific and the operators are exceedingly anxious to provide the vessels. There are so many thousands of casual tourists who wish to visit the war zones—some of them for terribly important reasons—and so many thousands of business people who have plans for expanding our foreign trade, that many ships operating for years to come will be taxed to the utmost. New horizons have spread themselves before us since the war. Myriad place-names on the Round-the-World route have assumed reality and it is safe to predict that a goodly percentage of the 858,000 public school teachers and 213,000 college and private school teachers are yearning to visit them.

Tourist travel has a dollar-and-cents significance in our national economy. It is an important means for the development of trade. We like to sell our goods abroad—and in fact we must do so to support one half of the

A SAN FRANCISCO PIER AT DEPARTURE TIME.
AT RIGHT: WAIKIKI BEACH, HONOLULU.

people in our cotton South, a third of those in our industrial East, and a fourth of our agricultural families and the industries that cater to them. Passenger travel creates much of the money exchange that pays for our exports, for our imports from other lands fall far short of our export values—values that we must increase in the future. So we need travel—and cargoes, cargoes and travel. We need *world-wide* travel and cargoes and the Round-the-World service of American President Lines gives just that.

In vast, overseas areas from Manila to the Red Sea this is the only passenger-carrying service under the American Flag. Thousands of American shippers and importers relied on its clock-like regularity over a 25,000 mile route, carrying the American Flag and American commerce to 23 ports in 14 countries. In addition to San Francisco and Los Angeles, New York and Boston, the regular route includes Havana, Cristobal, Balboa, Honolulu, Yokohama, Kobe, Shanghai, Hong Kong, Manila, Singapore, Penang, Colombo, Bombay, Suez, Port Said, Alexandria, Naples, Genoa and Marseille.

It is not easy to estimate the value of this great service

AT TOP, LEFT: THE OVERHANGING SIDEWALKS IN SHANGHAI.

CENTER: COOLIE RAINCOATS.

AT RIGHT: SCENE SO FAMILIAR IN SHANGHAI.

AT LEFT: DEPARTMENT STORE IN TOKYO.

ABOVE: FLOWER VENDOR, HONG KONG.

AT RIGHT: HONG KONG HARBOR AND VICTORIA PARK.

to the United States. The goodwill engendered in world ports and the examples of American living which it offers have an uplifting effect on other peoples; and the acquaintance with world conditions which our tourists and crew members acquire will also be beneficial. But the dollar values of the service to American industry is something that *can* be calculated. For instance, in the 16 years preceding 1940 the Round-the-World service earned and distributed to American suppliers, shipyards, and personnel, some $66,000,000 in freight revenues and $22,000,000 in passenger revenue.

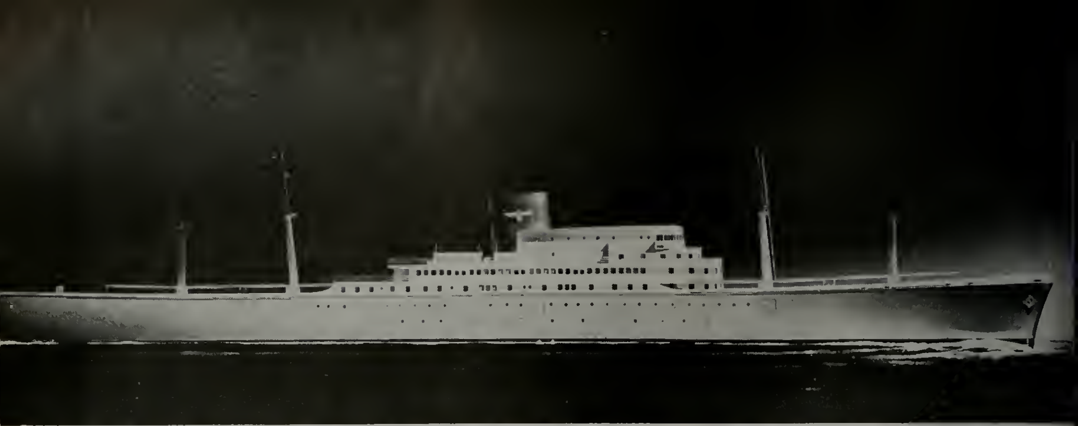
One item alone among the expenditures on this route is fuel oil—$14,000,000.

That hundreds of millions of dollars worth of the products of American farms and factories have benefited in no small way from the developments of our trade abroad, while the employment of thousands of seamen, stevedores, shipyard workers, dock employees, warehousemen, truckers, office staffs, and ships' officers has contributed to the growth of the Merchant Marine, as has the training of officers and crews.

The American President Lines is a well-managed company—one of the best in the world—and its sights have been trained on both the current scene and the long way ahead. No dividends have been paid on its common stock, all profits having been plowed back into its preparation for a future of service to the shipping public and compliance with its contract obligations to the Maritime Commission.

But its Round-the-World ships went to war and only two of the 14 are left. A minimum of seven modern fast ships is necessary for this route. The plans are completed and the Company is ready and anxious to make the purchase. The Commission can order the construction at any time now and a long step will have been taken in behalf of American commerce and industry—and national defense.

TYPICAL NATIVE STREET SCENE IN CHINA.



—The Proposed Ship

FOR SOME MONTHS the technical staffs of the American President Lines, San Francisco, and of George G. Sharp, naval architect, New York, have been working on a design for a Round-the-World passenger and cargo liner that would ultimately take the place of the modified C-3 type liners now in operation. This design, now complete, has several rather unique features which should add greatly to the comfort and convenience of passengers and to the facility of loading and discharging cargo. American President Lines executives regard this design as representing an ideal vessel for their Round-the-World service. The official designation of this design is P2-S1-DN1-V-2000.

In comparison with the C-3 Round-the-World liners, these new ships will be larger, faster, more streamlined and more beautiful. Characteristics are shown in a table herewith and some corresponding figures for the C-3 type are given as an interesting comparison.

The hull is of mild ship steel mostly welded and having a stem with a curved forward rake and a modified cruiser stern. As will be noted in the artist's sketch of the profile she has: a flush weather deck with very graceful sheer forward and aft; a progressive rake in masts and stack but vertical king posts; and a superstructure occupying a little more than one third of the overall length and located almost at mid-length of the hull. This arrangement as a whole gives a very trim, business-like appearance and produces a sense of ability and power that should be very reassuring to any Round-the-World seafarer.

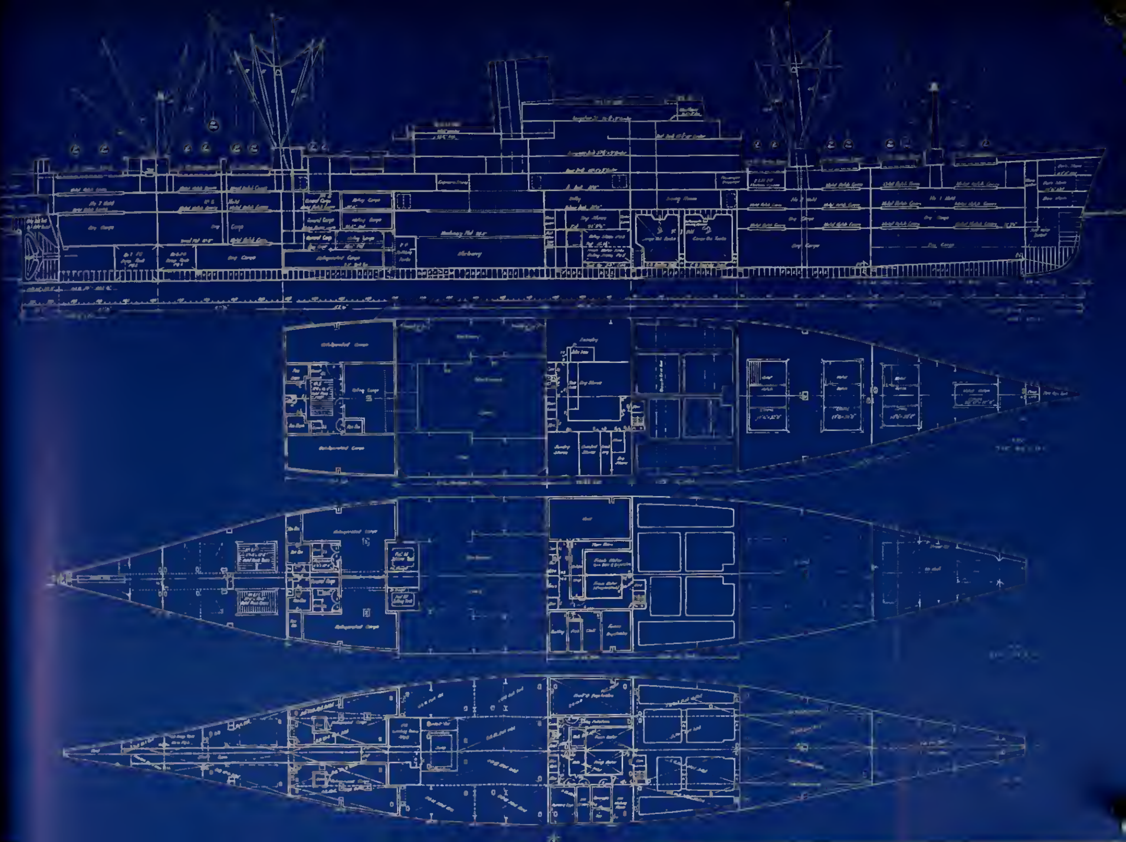
Nine watertight bulkheads divide the hull into ten main watertight compartments. First, starting from the bow is the conventional forepeak; then in order, holds No. 1, 2, 3 and 4; then the machinery space, holds 5, 6 and 7, and last the afterpeak. Watertight bulkheads No. 1 and No. 2 forward are complete from the tank top to the upper or weather deck. Bulkheads 3, 4, 5, 6 and 7 are complete from tank tops to A deck. Bulkheads 8 and 9 extend from tank top to upper deck.

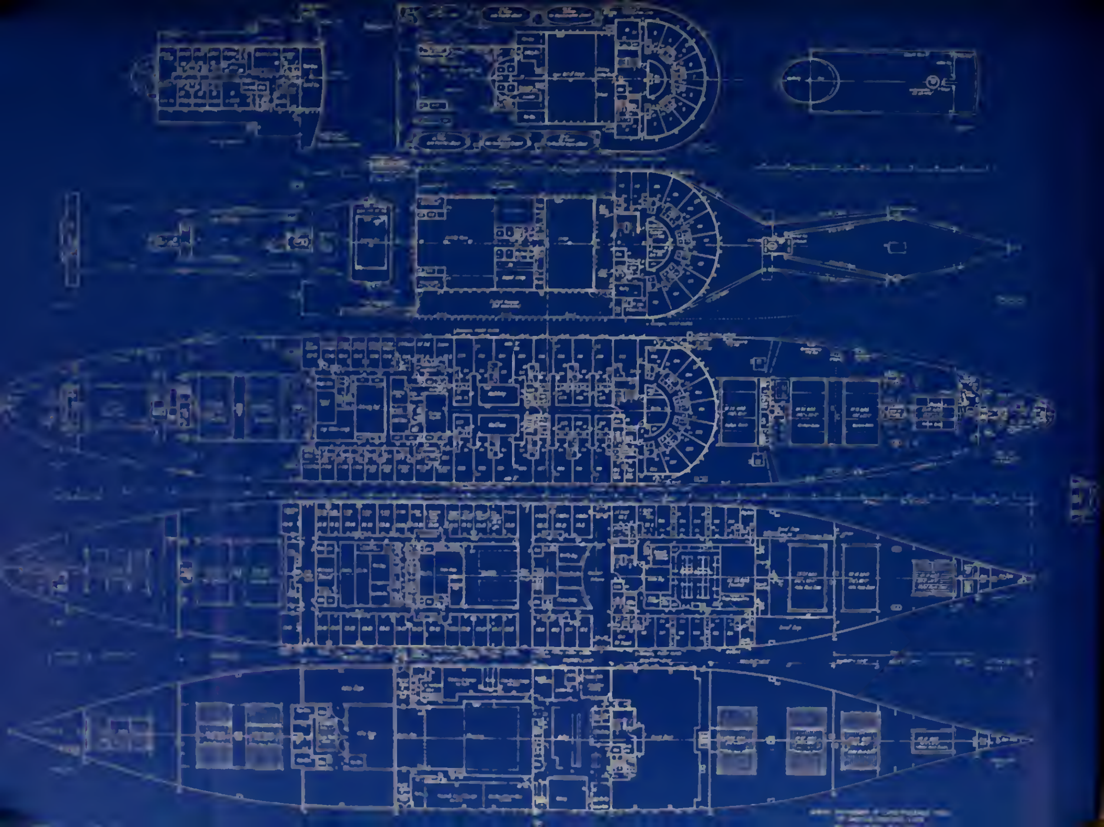
The compartments thus formed are in turn divided into many spaces for various uses. The fore peak houses the bos'n's stores, the anchor chain locker, a salt-water ballast tank; and a room on the first flat accommodating the motors for two vertical capstans on the upper deck and the resistors for the controls of these capstans and of the anchor windlass.

Hold No. 1

Next aft is Hold No. 1 which is 73 feet long fore and aft and is served by two hatches through each of four decks: the upper or weather deck, A deck, saloon deck, and a flat. The weather deck hatches are fitted with lift-off pontoon covers and on all the other decks the covers are metal hatchboards. The forward hatch of this hold is 16 feet thwartships and 20'3" fore and aft. The after hatch is 32 feet thwartships and 17'6" fore and aft.

Heavy king posts are located between these hatches with a small deck house between the posts for cargo air conditioning equipment. Each of these posts carries a 10-ton 55-foot boom on its after side and a 5-ton 55-foot boom on its forward side. Each boom is served by a winch. The reason given for this unusual arrangement of hatches is that a much greater space on the decks can be reached spotting cargo loads off the hook than with the conventional single hatch. All the usual Maritime Commission standard equipment for cargo holds is fitted, such as connections for smoke detection tubing; connec-


Dry Cargo
Refrigerated Cargo
No 1 Hold
Machinery



Principal Characteristics

Length—over all, about	536′—0″
Length—B. P.	500′—0″
Breadth—Molded	73′—0″
Draft—Maximum Molded	29′—6″
Depth—Molded to Upper Deck at side	49′—0″
No. of Crew (Exclusive of Spare Berths)	158
Passengers—Floor Beds and Sofas	122
Upper Berths	67
Total	189

Cargo Capacities (Estimated)

General Cargo Capacity	424,000 bale cu. ft.
Refrigerated Cargo Capacity	60,000 net cu. ft.
Cargo Deep Tank Capacity	48,000 net cu. ft.
Total Capacity	532,000 cu. ft.

Tank Capacities (Estimated)

Fresh Water	206 tons
Fuel oil (98% full)	2,429
Clean Salt Water Ballast	194
Total Capacity of Tanks	2,829 tons

tions for CO_2 fire extinguishing; ventilating ducts and outlets for cargo conditioning air; access ladders; and cargo battens. Cargo battens on this ship except where excessive curvature of the vessel's form indicates horizontal battens will all be vertical. This type of batten fitted between frames offers better protection to the cargo and increases the cubic capacity of a hold about 1 per cent.

Hold No. 2

Hold No. 2 is 62 feet 6 inches fore and aft and is arranged and equipped similarly to No. 1 from the A deck level down, except that both hatches for this hold are 32 feet athwartship and 17 feet 6 inches fore and aft. On the A deck level there are large compartments port and starboard for special cargo, a strongroom, and a room for cargo air conditioning machinery. The after hatch is trunked passing through a large baggage room from A deck to the upper deck. Between the hatches on the upper deck is a heavy steel mast serving as a king post and set on the centerline of the ship. Surrounding this mast is a T-shaped house enclosing lockers for deck gear, companionway to saloon deck and a room for cargo

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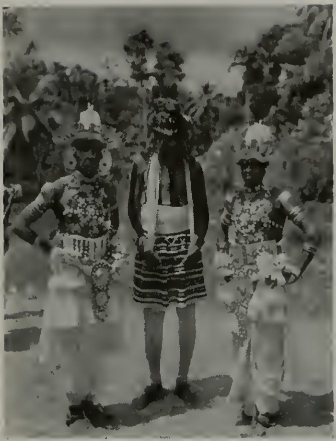
ABOVE: SCENE ALONG THE SHANGHAI BUND.

◄

AT LEFT: SCENE OF THE HARBOR IN SHANGHAI.



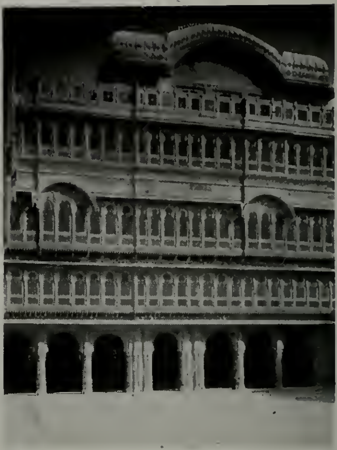
◀

Natives of Ceylon, two members of the Kandyian dancing troop with representative of the Devil Dancers (dressed as a wolf).

▶

BIKANER STATE, RAJPUTANA, INDIA

Inside a court at Lallgarh Palace. Behind these exquisitely carved windows are the quarters of the ladies, and from hallway and balcony they have a clear view of all that goes on below without the visitor gaining even a gimpse of them. The custom of "purdah" is still practiced in many of the native states. Nowhere else in the entire world will a traveler find better stone carving.



air conditioning. This house supports pads for the lower ends of four cargo booms, two 10-ton 60 feet 5 inches long, and two 5-ton 52 feet 6 inches long. In the trunked portion of the after hatch is fitted a hinged platform, with a portable rail, about 8 feet by 17 feet, that offers an excellent plan for handling heavy baggage. A four foot wide watertight door through the after bulkhead of the hatch trunk gives access from this platform directly into a large baggage room fitted with ample racks and shelves to make baggage accessible to the passengers, an idea that will undoubtedly find great favor with passengers on the long Round-the-World trip with its wide variations in climate.

Hold No. 3

Hold No. 3 is a cargo hold only below the saloon deck level. From the tank tops to the saloon deck level it is filled with cargo oil tanks which are loaded through side ports, and a 5 feet by 7 feet hatch in the saloon deck. The six cargo oil tanks will accommodate approximately 1200 tons of oil. They are so designed that the interiors are entirely free of stiffeners and all corners are rounded. The design is based on former experience of American President Lines with tank cargoes. Just aft of this passage is the passengers' dining room, roughly 44 feet fore and aft and 70 feet athwartships with an inset 12 feet by 35 feet taken for stairways, elevator and lockers. On A deck level this vertical division includes: seven passenger rooms; chief purser, and chief steward's room, a room for 2 stewardesses and 1 child's nurse; the barber shop, automatic telephone exchange; music broadcast room;

ISLAND OF CEYLON

A prominent street in Handy and a comprehensive view of this interesting place. The signs displayed over the shops tell a story in themselves. Portuguese and Dutch, English and Singalese—all cry for attention; and why not—for the Dutch and Portuguese contributed many things to Ceylon. Thousands of loyal subjects of mixed blood, especially from the Portuguese occupation, are a useful and intelligent part of the population.

the passenger elevator; main staircase; pantry and various lockers. No. 3 hold is 50 feet fore and aft.

Hold No. 4—Main Galley

The main galley which prepares meals for the entire complement of passengers and crew is all electric, and is directly aft of the main dining room on the saloon deck and directly over hold No. 4 which is completely devoted to dry and refrigerated galley stores. On the tank tops this space embraces a large refrigerated chamber on the port side for fruits and vegetables; tanks for milk and for fresh water amidships; and butter and eggs, ice cream and beverage chambers and an ice-cream making compartment on the starboard side. On the 14 foot 4½ inch flat are: fresh water and distilled water tanks amidships; poultry, fish, chilled and frozen vegetable rooms, starboard; and a large meat room port.

On the 22 foot 9½ inch flat are the dry stores, the ship's laundry, and the clean linen lockers. These stores are loaded through side ports and athwarthship passage on A deck and brought down to the various levels by vertical conveyor and elevator. They are all very conveniently arranged both for ease of stowage in loading and accessibility from the galley.

There is ample room for stowing large quantities of refrigerated foods and the space allotted to the various categories indicates the planning of well balanced menus. The galley takes a space 40 feet by 70 feet and is very well arranged. From forward aft on the starboard side are arranged, the cold pantry, the bakery, and the pot and pan scullery. Port side houses the dish and glass scullery, the butcher shop with its service refrigerator; and the vegetable preparation room. Against the forward bulkhead is a coffee pantry, the cook's office and a silver room. At the after bulkhead is a silver cleaning room; the conveyor and elevator system for loading and unloading stores, and the access stairs to A deck above and the flats below.

The system of doors into the dining room is arranged for entrance from the galley only on the starboard side, and exit from the dining room only on the port side. Above the galley on A deck are the passenger entrance lobby, purser's office, purser's workroom, novelty shop and some crew accommodation.

The Great Pyramids of Egypt.

Temple guard in China.

Machinery Space

In the machinery space which occupies 70 feet of the length and at the saloon deck level directly aft of the galley there are flats port and starboard with fore and aft passageways directly outboard of the machinery space casing and giving access to: the deck officers' mess, and the stewards' mess starboard; and the crew's mess and petty officers' mess port. A pantry on each side facilitates service to these messes. On this same level amidships is the engineers' shop and side ports for loading fuel oil and engine room stores. On the A deck level above this space are the fidley, engineers' stores, fan room, electricians shop and crew accommodations.

It is noteworthy that the modern plant for fueling the passengers and crew of this ship occupies approximately the same proportion of the length of the hull that formerly would have been occupied by the vessel's steam propulsion plant in the days of Scotch boilers and "up and down" engines. The modern high pressure water tube boilers and high speed reduction gear turbines of this ship are all enclosed with ample room for accessibility in a space less than one third that occupied by the crew and passenger fueling plant mentioned above. In other words, it takes much less of the revenue cubic of a modern cargo and passenger liner to fuel 12,500 horses than it does to fuel 347 men and women. Most of the fuel for the horses is carried in the non-revenue double-bottom tanks where-

Marine Memorial in Havana, Cuba.

as the fuel for passengers and crew occupies practically the whole of one hold.

Afterholds

On A deck over the after end of Hold No. 5 there is a thwartship passage with side ports and a pair of vertical conveyors serving the A deck level down. A 10 feet by 16 feet hatch trunked from promenade deck to A deck also serves this space. In all the handling the cargo through side ports overhead gear will be used.

Holds No. 6 and 7 have practically the same arrangement as No. 1 and 2 forward, except that in addition to the regular 5 and 10 ton booms No. 6 has a 30 ton 70 feet boom fitted, and that No. 7 has only one hatch which is 32 feet 6 inches fore and aft and 20 feet thwartship.

The after peak at the saloon deck level houses the hydro-electric steering gear and on the A deck level takes care of the ship's brig, lamp, paint and chain lockers, engineers' and bos'n's stores and carpenter shop.

These arrangements of the principal watertight subdivisions of this design show careful planning for convenience and economy in the functions of passenger ship operation.. It will be noted in the foregoing description and in the inboard profile reproduced herewith that all of the commissary and refrigerated stores are located directly below the main galley and all the dining rooms, both passenger and crew, are directly contiguous to the galley fore and aft, and on the same deck level. The tankage cargo is complete in another hold subdivision. All refrigerated cargo is completely and exclusively in its own watertight hold division. The baggage room is very conveniently located and efficiently served through one of the main cargo hatches.

Passenger Accommodations

The same careful planning is evident in the arrangement of the public rooms and sleeping accommodations for passengers and crew.

All accommodations except the galley and dining room are on A deck level or above. From the after end of the passenger dining room on the saloon deck, two stairways, one for passengers, the other for crew, and an elevator run up through A, upper and promenade decks to the boat deck with spacious landings on each deck.

The landing on A deck opens aft directly onto the passenger entrance and its thwartship passage, and opens forward to a number of bedrooms, the barber shop and the baggage room.

Upper deck landing opens aft into a centerline passage giving access to many bedrooms and to the children's playroom and the hospital. Forward, it gives access to a number of fine bedrooms circularly arranged across the front of the superstructure.

Arrangement of Public Rooms

At the promenade deck level the landing gives access forward to a circular passage which serves 11 beautiful rooms at the front of the house and on the inner side a passenger laundry and a passenger dark room for photographic developing. This landing opens aft into a 10 foot wide thwartship covered passageway that opens port and starboard on the enclosed promenades each of which is 14 feet wide and 100 feet long. The passage serves as a continuation of the promenade and gives access from the crew's stairway to the public rooms and to a pantry on the forward side of the passage starboard, from which refreshments may be served either to the public rooms or on the promenades. Stowage for deck chairs is arranged on the forward side of this passage.

It is noteworthy in this arrangement that there is no access to the public rooms except on the centerline from this passage and on the centerline aft. This we think is an improvement over the many doors that are usually planned for these rooms. On the after side of the passage large double doors enter the passenger lounge. On the after bulkhead of the lounge double doors open a centerline passage running aft 25 feet to the smoking room. Port and starboard, opening off this passage are women's and men's lavatories and various lockers. Opening only off the smoking room on the port side, is a card room, on the starboard side a cocktail lounge. The smoking room opens aft on the centerline through large double doors onto the deck surrounding the swimming pool.

On the boat deck level the stair and elevator landing opens on the centerline directly into a writing room that forms a balcony across the forward end of the lounge clerestory and the floor of which is the roof of the thwartship passage on the promenade deck. Forward this landing is formed into a thwartship passage serving two rooms and opening port and starboard onto an open semi-circular gallery around the forward end of this deck. Springing from this passage is a semi-circular aisle serving 9 bedrooms. Aft on the boat deck is an awning covered deck game area. The unique feature of the passenger accommodation is the series of bedrooms forming the forward end of the house on the upper deck, the promenade deck and the boat deck. Here are a total of 27 rooms, each shaped as a segment of a circle and having windows on the periphery of the circle with a clear outlook to the sea. These rooms should be very alluring to

(Please turn to page 128)

The Corsair, as she will appear in cruise service to Alaska and to the south seas.

The Corsair Conversion

THE STEAM YACHT CORSAIR, built in 1929 at Bath Iron Works, Bath, Me., for the late J. Pierpont Morgan, is now being converted to a luxury cruiser at the Victoria Machinery Depot shipyard in Victoria, B. C. to plans and specifications recently completed by Joslyn and Ryan (M. P. Ryan) widely known firm of naval architects and marine engineers of San Francisco, California.

Principal characteristics of this vessel as converted will be:

Length Overall	343′ 6″
Length B. P.	280′ 0″
Beam Molded	42′ 8″
Depth Molded	27′ 0″
Draft Loaded	22′ 6″
Turbo-Electric Drive, Twin Screw	
Propulsion Power Total	6000 shp.
Passengers	85
Crew	80-85

An interesting feature of this yacht as developed for Mr. Morgan, was the large size of the staterooms. A huge Master suite for Morgan was rather isolated from the other quarters, with a private promenade where he could "walk up and down in pajamas if he felt like it without having guests or crew get in his way. Had a mind of his own, the Commodore did."

In addition there were 10 guest staterooms and four smaller rooms for valets or maids. Some of his friends tried to interest Morgan in a gyro-stabilizer for this vessel, but he said "Anyone who minded a bit of pitching or rolling now and then, didn't have to accept any more invitations."

The Corsair had a varied career. After numerous sea cruises under Morgan's ownership, she was sold to the British Navy at the outbreak of World War II and was assigned to convoy duty in the South Atlantic which proved in her case to be rather uneventful. At the end of the war she was purchased by Seattle interests for an undisclosed price. Under the name Pacific Cruise Lines, Ltd., these interests intend to sail her on leisurely cruises to Alaska in summer and South Pacific in winter. Work on conversion is now being rushed to completion in order to have the ship ready and available for the summer cruise season of 1947.

Accommodations

Joslyn and Ryan's plans for conversion show the original guest room boundries left intact. The beautiful teak panelling of these rooms was found to be practically unmarred by the war experience and therefore could be retained and somewhat modified to harmonize with the contemporary design of the new interior and furnishings.

On the navigating bridge deck there is a large open bridge space forward and port and starboard of the wheelhouse. Aft of the wheelhouse are in order: a chart room with built-in berth, chart table, and stair to deck below; radio room with accommodations including bath, for the operator; at port side, chief officer's stateroom and at starboard side, captain's stateroom, each with private bath. Farther aft on this level is a large open space laid out for deck games.

On the boat deck level at the forward end of the house is a large observation lounge 24′ x 28′ which is fitted with Kearfott Clearvu windows and will be a very popular spot from which to view the British Columbia and Alaska coast scenery. An interesting feature of this room is the glass enclosed compartment at its center wherein is enshrined the master unit of the Sperry MK 14 gyro compass system. The interested passenger can here observe the changes in the compass pointer which it is thought will be very interesting in navigating the tortuous bends of the inland passage.

Aft of this room is a lobby off which aft opens a suite consisting of bedroom and sitting room and private bath. The space at the after end of the bridge erection on this deck houses two sound insulated compartments, one for the ventilating fans, and the other for the emergency generating set. Hung from Welin quadrant davits amidship on this deck are four life boats (three of which are oar propelled and one motor propelled), with a combined capacity of 178 persons.

The boat deck afterhouse contains; eight two person bedrooms, one single bedroom, and one three room suite, all with private bath; a cosy cocktail lounge completely sound insulated; and a large main lounge with a central dance floor.

Forward of frame 101 on the main deck and of frame 86 on the cabin deck, the space is all devoted to crews' quarters. The main deck house aft of frame 98 encloses: chief stewarts' room starboard and officers' mess port; the galley; the passengers' main dining room with seatings for 44; the fidley with a stateroom and office for the chief engineer on the port side, and a wide enclosed passage on the starboard side running aft to the cruise director's office and stateroom; and machinery casing with beauty shop and barber shop on the port side. From frame 101 aft to frame 48, the main deck has an eight-foot wide clear space between the side bulkheads of the house and the port and starboard bulwarks. Aft of frame 48, the house is being brought out to the shell plating line to allow more spacious passenger rooms. The cruise director's office on the starboard side, is included in this widened portion of the house. Opposite on the port side is a nice two-room and bath apartment. Aft of these and opening off a midship passage are 16 large staterooms each with private bath and several arranged in pairs, with a connecting door.

Below, on the cabin deck aft are: four two-room suites; four staterooms for two passengers each; and two single

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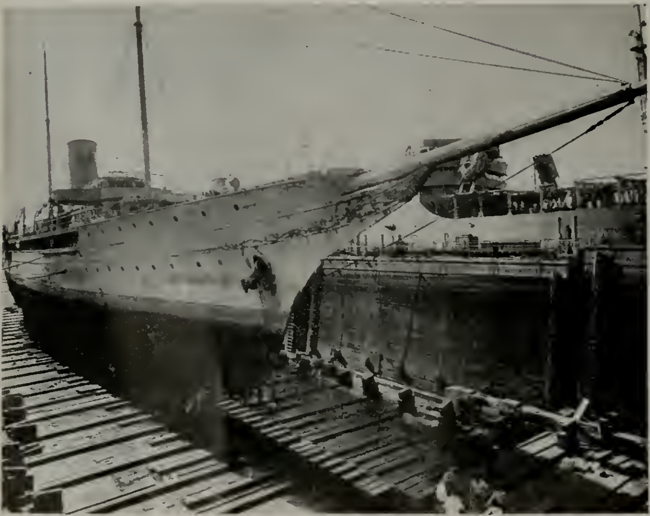


The Corsair, former luxury yacht of J. P. Morgan, in dry dock at Todd Shipyards Corporation, before she was moved to the West Coast for reconversion.

The New House Merchant Marine Committee—And Chairman Fred Bradley

By JAMES S. HINES

THE NEW CHAIRMAN OF THE MERCHANT MARINE & Fisheries Committee, Fred Bradley (R-Mich), has been connected indirectly and directly with shipping on the Great Lakes ever since 1911. His father, the late Carl D. Bradley, was one of the pioneers in the development of the self-loading freighters on the Great Lakes and the largest vessel of that type in the world today carries his name. This steamer, with five others, is operated by the Bradley Transportation Company of Rogers City, Michigan, which is a wholly owned subsidiary of the United States Steel Corporation, and prior to coming to Congress, Chairman Bradley served as purchasing agent for that steamship line as well as for its parent company, a large limestone quarry.

Mr. Bradley from boyhood on was an inveterate traveller on the steamers of the Bradley Line and gained an intimate knowledge of operating conditions in the pilot house and engine room. While he was serving as purchasing agent, two new vessels were built for the Bradley Transportation Company and it was his responsibility to purchase all of the complicated machinery that went into these two ships—which, incidentally, were the first turbo-electric ships built for the Great Lakes. He therefore of necessity made the acquaintance of many shipping men on the Great Lakes and on the various coasts and also came in close contact with many of the leading architects and ship machinery engineers and consultants.

Mr. Bradley has served on the Merchant Marine & Fisheries Committee for almost eight years and is keenly aware of many of the problems facing the industry today. He not only is aware of these problems but in some instances is keenly disturbed by them. He is disturbed by the fact that unless something constructive can be done about it, we may see all of our passenger traffic taken over by foreign flag ships. This is due in part to two principal factors. First of all, our considerably higher operating costs; and secondly by the unfortunate impression which our own citizens and our foreign travellers have of the cuisine on American ships and the reputation which we seem to have acquired in recent years for a lack of courtesy on the part of some of the members of some of our crews. However, he has been getting the most encouraging reports from the operation of the S.S. AMERICA, now under charter to the U. S. Lines on a day to day basis. In the operation of that splendid vessel, no greater courtesy nor better food can be found on the high seas. And that in itself proves that labor and management can work together if they will. It is definitely certain that we cannot see the permanent return of the American flag to the high seas unless those relations continue to improve.


Chairman
Fred Bradley
(R-Mich)

On February 10th, the House of Representatives restored to the Merchant Marine & Fisheries Committee its full investigative powers, which it has maintained in the past several Congresses. These powers were removed temporarily under the Congressional Reorganization Act of 1946. Mr. Bradley has emphasized that it is not the intention of his Committee to engage in any witch hunts, but they do intend to look into the present and the future operation of the various functions that come within the purview of his Committee. For instance, we have about 16 million tons of laid-up ships, which may or may not be *properly* laid up, and that will be investigated at once. As chief investigator for the Committee, Mr. Bradley has secured the services of one of his long-time friends and associates, Guy H. LaBounty, who has been sailing on the Great Lakes for 38 years, who has been associated with the same Line as Mr. Bradley for the past 29 years, and has been a chief engineer for the past 25 years.

Another matter which will be closely followed by the Committee are the transactions of the Maritime Commission in disposing of our tremendous war-built fleet and which will be carried out in strict accordance with the Ship Sales Act of 1946. There is also the question of watching the charter hire of some of this fleet to American operators and the early return to American shores of some 300-odd ships that we lend-leased to Great Britain and which are still operating under the British flag on terms much more favorable than to the American operators engaged in the same competitive trade. Whether there can be any recapture of the ships similarly lend-leased to Russia is at present in doubt, in view of the fact that while they were traversing the Japanese war lanes, while Russia was not at war with Japan, our Government saw fit to give them actual title to these ships and the Russians now seemingly take it for granted there will be no recapture of those ships.

The Committee will also in its normal course discharge its responsibilities in the operations of the Maritime training program, the operations of the Coast Guard, Coast and Geodetic Survey, and will look into conditions in the Panama Canal Zone. The study of our fisheries—in both salt water and fresh water—will come in for considerable consideration.

Mr. Bradley has divided up his Committee into eight subcommittees, each to deal with separate problems and each empowered to hold its own hearings in the hope that the operations of the overall Committee can be expedited thereby.

THE HOUSE MERCHANT MARINE AND FISHERIES COMMITTEE IN THE 80th CONGRESS IS MADE UP AS FOLLOWS:

FRED BRADLEY, Mich., Chairman

Alvin F. Weichel, Ohio
T. Millet Hand, N. J.
Henry J. Latham, N. Y.
David M. Potts, N. Y.
Willis W. Bradley, Calif.
Franklin J. Maloney, Pa.
Thor C. Tollefson, Wash.
Raymond H. Burke, Ohio
John J. Allen, Jr., Calif.
Horace Seely-Brown, Conn.
John C. Brophy, Wis.
Robert Nodar, Jr., N. Y.
Edward T. Miller, Md.
Schuyler Otis Bland, Va.
Edward J. Hart, N. J.
Herbert C. Bonner, N. C.
James Domengeaux, La.
Henry M. Jackson, Wash.
Eugene J. Keogh, N. Y.
Cecil R. King, Calif.
Emory H. Price, Fla.
Franck R. Havenner, Calif.
Leo F. Rayfiel, N. Y.
Prince H. Preston, Ga.

STANDING SUBCOMMITTEES:

No. 1. Ship Construction and Operation and Maritime Labor
WILLIS W. BRADLEY, Calif., Chairman
No. 2. Maritime Affairs
HENRY J. LATHAM, N. Y., Chairman
No. 3. Salt-Water Fish and Shellfish Problems
THOR C. TOLLEFSON, Wash., Chairman
No. 4. Panama Canal
DAVID M. POTTS, N. Y., Chairman
No. 5. Coast Guard, Coast and Geodetic Survey, and Public Health Service
T. MILLET HAND, N. J., Chairman
No. 6. Ship Sales, Charters, and Layups
ALVIN F. WEICHEL, Ohio, Chairman
No. 7. Inland Waterways and Fresh-Water Fisheries
ALVIN F. WEICHEL, Ohio, Chairman
No. 8. Conservation of Wildlife Resources
RAYMOND H. BURKE, Ohio, Chairman

THE NEW SENATE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE ARE AS FOLLOWS:

Senator Wallace H. White (R), serving as chairman. Other Republicans on the committee are: Charles W. Tobey of New Hampshire; Clyde M. Reed of Kansas; Owen Brewster of Maine; Albert W. Hawkes of New Jersey; E. H. Moore of Oklahoma; and Homer E. Capehart of Indiana.

Democratic senators on the committee are: Edwin C. Johnson of Colorado; Tom Stewart of Tennessee; Ernest W. McFarland of Arizona; Warren G. Magnuson of Washington; Francis J. Myers of Pennsylvania and Brien McMahon of Connecticut.

Seven of the 13 senators on the committee are from states bordering on salt water while the House Committee on the Merchant Marine has 21 of 25 members from salt water states.

Marine Exposition in San Francisco Will be Representative of Entire Industry

The exhibitor's list for the Second Annual National Marine Exposition sponsored by the Propeller Club of the United States is growing daily, and now includes the following:

Adel Precision Products Corporation, ALCOA Steamship Company, Aluminum Company of America, Amercoat Division, Amer. Pipe & Const. Co., American Export Lines, Milo Atkinson Company, Atlantic-Pacific Manufacturing Company, Atlas Imperial Diesel Engine Company, E. J. Bartells Company, Cummins Engine Company, Inc., Dearborn Chemical Company, Devoe & Reynolds Company, Inc., Ets-Hokin & Galvan, Enterprise Engine & Foundry Company, Electric Storage Battery Company.

Flexitallic Gasket Company, Gamlen Chemical Company, General Electric Company, Globe Wireless Ltd., A. P. Green Fire Brick Company, Frank Groves Company, C. J. Hendry Company, Hercules Equipment & Rubber Company, Higgins, Inc., Hooper Valve Company, International Paint Company, Inc., Johns-Manville Corporation, Thomas Laughlin Company, The Log, Lorimer Diesel Enginee Company, Mcwhythe Company, Mackay Radio & Telegraph Company, Marine Catalog & Buyers Guide, Marine Engineering & Shipping Review, Marine News, Metalock Casting Repair Service.

National Inventory Board, Nordberg Manufacturing Company, Pacific Marine Review, The Propeller Club of the United States, Radiomarine Corporation of America, Sausalito Shipbuilding Company, George C. Sharp, The Simmons Company, Sperry Gyroscope Company, Inc., Standard Oil Company of California, Submarine Signal Company, Triangle Boat Company, Tubbs Cordage Company, U. S. Coast & Geodetic Survey, United States Gasket Company, U. S. M. S. Officers School, U. S. Navy.

Vickers Inc., Wall Rope Works, Watson & Meehan, Weeks-Howe-Emerson, Westinghouse Air Brake Company, Western Electric Company, Western Gear Works, Wilcox-Crittenden & Company, Thomas C. Wilson, Inc., Worthington Pump & Machinery Corporation, H. G. W. Young Company, C-O-Two Fire Equipment Company, John A. Roebling's Sons Company of California.

.. With The Port Engineers ..

The Economical Maintenance of Turbine Geared Prime Movers

By GEORGE BARR, General Electric Company

A LARGE PROPORTION OF MODERN CARGO VESSELS and most of the passenger Liners in the United States are propelled by turbine geared machinery. So far very little has been written on the subject of maintenance and repair on this type of machinery and we are continually being asked, by marine engineers, if useful publications are available and from the number of questions in the "Question and Answer" sections of marine engineer magazines it is very evident that there is a crying demand for practical information on the subject.

Maintenance

Under good operating conditions rotary equipment does not require constant adjustment as bearings are not subjected to hammer effect. The question then is how often should turbine gear units be inspected and by what methods should repairs be made. To answer the first question it is necessary to make a distinction between routine inspection for the owners and periodic survey which is an official requirement for classification.

The routine inspection is a function which is entirely at the discretion of the owners. Some call for annual inspection. Some call for inspection every second year, yet others seem to feel that every fourth year is sufficient. This inspection is a form of insurance. It is a physical checkup and, in our opinion, it takes away the possibility of an inquest and all that can mean.

This inspection consists of a simple examination of the gear teeth through the inspection openings, examina-

During the February meeting of the Society of Port Engineers George E Barr General Electric's popular Marine Superintendent was guest speaker Seated at the head table are Frank Smith president Louis Deppman vice president and Joe Gisler chairman of the Board of Governors

tion of high speed thrusts, flexible couplings and pinion bearings.

On the turbines it is only necessary to inspect bearings, thrusts and packings. It must be remembered, however, that it is always good policy to review the engine room log before deciding how much of the turbine should be inspected. If it transpires that consumption of steam has increased radically, to maintain standard speed, or in other words if the speed falls off, to any great extent, without a corresponding decrease in nozzle opening the turbine casing should be raised, as a slowing down of the unit may be due to boiler carryover which must be removed manually from the internal parts of the turbines.

If unusual conditions occur, or gradually develop, such as heavy vibration of turbines or undue noise in reduction gears an investigation should be made at the earliest possible moment. If turbine vibration develops while the unit has been steaming steadily, speed should be reduced to a point where the vibration disappears and held there until the vessel reaches port.

In the case of vibration while getting underway, provided no work has been done on the equipment, the trouble is almost sure to be caused by improper warming up and when vibration from this cause is noticed the power procedure is to slow down until the rotors gather a uniform temperature. Complete information on this subject of warming up may be found in the Instruction Books which have been furnished by the engine manufacturers.

In the case of excessive and continued vibration, a thorough checkup of all external parts should be made before deciding that there is something wrong internally. The trouble may be caused by worn journal bearings, worn couplings, worn thrusts or local misalignment, and therefore, not a case of actual unbalance. In our opinion less than 50 per cent of vibration complaints is caused by unbalance and yet unbalance is generally supposed to be the principal cause of all vibration.

In the case of a turbine rotor actually going out of balance, three points should be checked before attempting to do any rebalancing. The buckets or blading should be checked for soundness. The shaft should be indicated for run out and the entire rotor should be checked for cleanliness, if the latter is at fault a cleaning job will restore balance, if the shaft has taken a slight permanent set a compensation can be made to fully restore balance. If buckets or blades are loose rebucketting and rebalancing is the only salvation.

If it is necessary to rebalance small rotors the work should be done on a dynamic balancing machine, on shore. On large rotors, such as the L.P. unit, dynamic balancing can be done without removing the rotor from its own bearing, but as a rule it is necessary to expose the rotor during the process. In fact, it pays to do the work with the top half of the turbine casing removed.

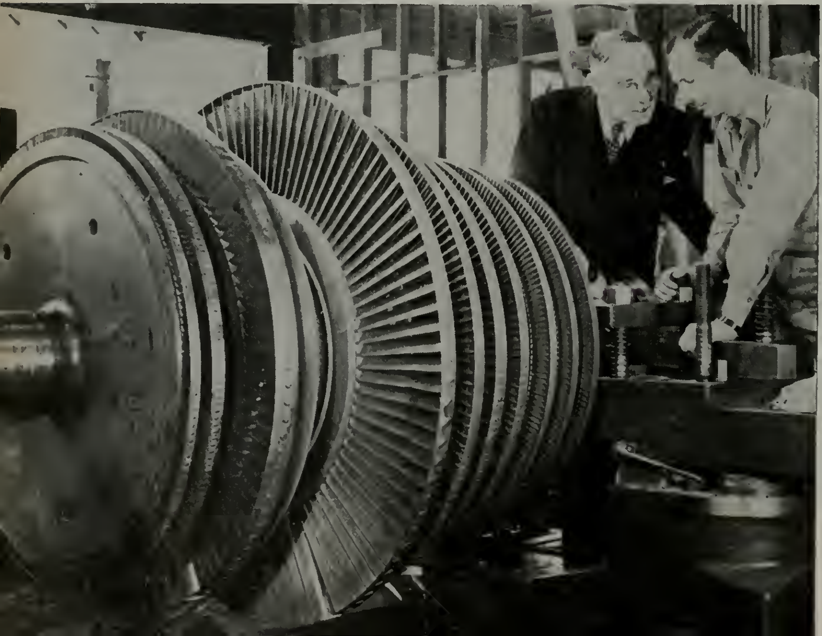
Correction of Alignment

Where apparatus has been properly installed the possibility of it going out of line is quite remote yet it does occur if bearings wear out of shape or if foundations are disturbed.

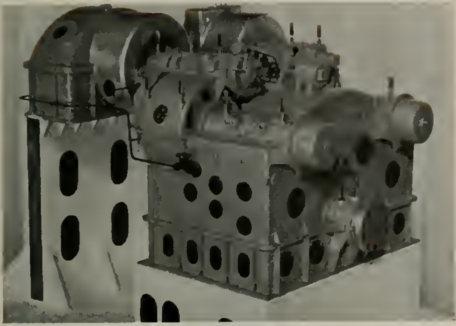
Flexible couplings, between the driving and driven elements, allow for a certain degree of misalignment but it is good practice to use the same precision in linking up rotors with flexible couplings as for rotors with solid couplings.

Carbon Packing

On all turbine gear sets, built for the U. S. Maritime Commission, carbon rings are used as shaft packing. As a general rule the manufacturers of turbines furnish



Low pressure turbine rotor having packing journals corrected. Left in the picture is Mr. Barr.



Model of G-E cross-compound geared marine steam turbine.

sufficient information for operation and maintenance of this packing, nevertheless, there is a constant inquiry from marine engineers for more detailed information and unfortunately, in some cases, their inquiries are misdirected. Often the information they receive is misleading. In fact, we have noted some of the called "Hints" in engineering publications that contradict the manufacturers instructions and which, if followed could give the engineer some bad moments.

In the first place, carbon packings are designed to have shaft clearance and under no circumstances should the clearance be reduced below the dimensions given by the manufacturers. In actual practice we have found carbon packing operating perfectly with running clearance 50 per cent greater than the original size. The coefficient of expansion of carbon is only 25 per cent that of steel; therefore it is necessary to make the proper allowance for shaft expansion so that the carbon rings will not touch the shaft during operation.

Carbon packings are commonly blamed for loss of vacuum when the actual trouble is elsewhere.

In the repair of damaged or worn parts of turbines and gears certain rules must be observed and the first rule is that high class machinery requires high class workmanship, so the repair of turbines is not a job for inexperienced workmen. In reviewing the repair work of the war years, we find that the only serious casualties to turbine geared sets have been caused needlessly and in every case, by a misunderstanding of simple repairs. Rotors have been damaged by inexperienced men attempting to fit packing according to their own ideas. They do not appreciate that stationary parts must stand clear of spinning rotors. They dress down the butt joints of carbon rings until they hug the shaft and depend upon the shaft to wear its own clearance. That procedure was common practice when turbines were operated on saturated team, but it is a fatal mistake to apply it to turbines that are operated on superheat.

Bearings

As a rule, on turbines and gear installations, bearing wear is negligible, but bearings may be wiped or in-

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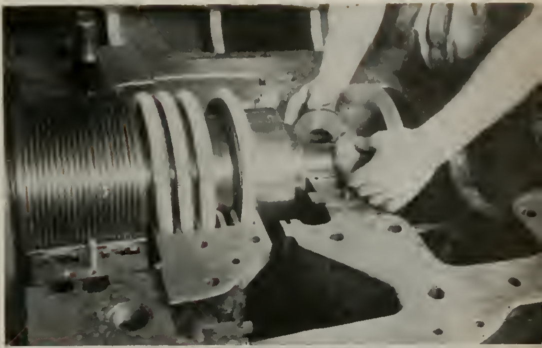

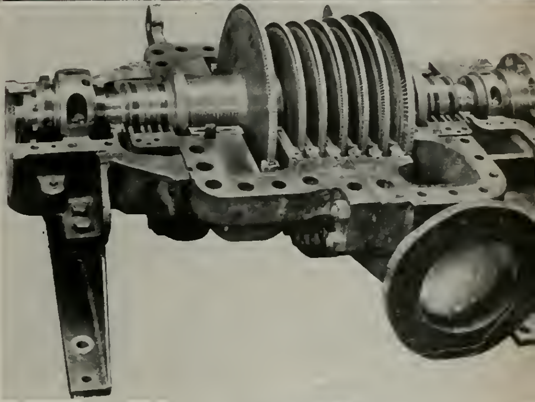

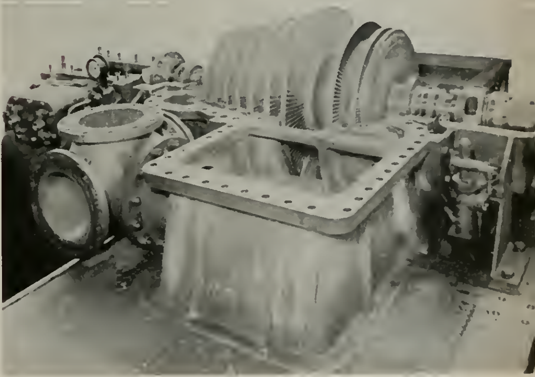

Upper right: Thrust plate being placed in high-pressure marine steam turbine. This was taken in the G-E Lynn River works.

Center: High-pressure element (without upper half casing) for G-E cross-compound geared marine steam turbine.

Below right: Low-pressure element (without upper half casing) for G-E cross-compound geared marine steam turbine.

Alloy Steels in the Shipbuilding and Ship Repair Industry

By GEORGE M. HUCK


George Huck, manager of Sales for Alloy and Tool Steels, Bethlehem Pacific Coast Steel Co., holds a Metallurgical Engineer's degree from the University of Minnesota, and started with Bethlehem Steel Company in Bethlehem, Pa. plant in 1926. In 1938 he was made metallurgical engineer for special steels sold on the West Coast. Since 1943 he has been Manager of Sales of all alloy and tool steels sold by Bethelehem Pacific.

ALLOY STEELS MAY BE DEFINED as those steels which owe their special properties to the presence of one or more special elements or to the presence of greater than usual proportions of elements like manganese or silicon normally present in plain carbon steels.

They are manufactured by the same process as ordinary carbon steels; that is, in the open hearth or electric furnace, though the greater tonnages are produced in the former.

The majority, if not all, of the metallic elements have been added at one time or another to steels—at least in an experimental basis,—but those now commonly used are listed below:

Manganese
Silicon
Phosphorous
Sulphur
Aluminum
Chromium
Molybdenum
Cobalt
Nickel
Tungsten
Copper
Vanadium
Zirconium
Titanium
Columbium
Silenium
Lead

In comparing carbon and alloy steels, we find that the latter serve to defeat a variety of destructive forces encountered in machinery and equipment of many types. In addition to providing higher strength per unit of weight, without impairment of safety, alloy steels permit improvement in resistance to fatigue, corrosion, wear, the weakening efforts of high temperatures and the embrittling effects of sub-atmospheric temperatures.

As a rule, the processing of alloy steels is more involved than treatment given carbon steels. From refinement in the steel making furnaces through rolling, heat treatment and subsequent finishing operations, the control of the various operations is usually more closely checked. The ultimate aim in all steel plant procedures is to produce a steel with a set of physical properties which will best fit the application to which the steel will be put. With few exceptions the service demanded of alloy steels is higher than with carbon steels.

The correct application and the right steel to use is in itself a comprehensive field. Bethlehem Pacific's Metallurgical Contact Service is constantly engaged in studying steel applications and making recommendations for better service to the many steel consuming industries in the West. In some cases an alloy steel is not the right steel to use and a cheaper carbon steel has at times been recommended by our Metallurgical Department. Sometimes the machining practices must be changed or the method of fabrication and heat-treatment is not right. In every case, however, whether the steel be of alloy or carbon analysis, the aim is to produce a steel which will provide the physical properties desired at the lowest possible cost to the user.

Of the myriad industries on the Pacific Coast in which Bethlehem alloy steels are daily solving problems of efficiency, ruggedness and volume production with improvement in quality and little or no increase in cost, the shipbuilding industry is one that has particularly benefited. In fact, it could not have assumed the tremendous proportions it did during World War II without the major part played by alloy steels.

Take Bethlehem Steel Company's San Francisco Yard as an example. This yard, the only commercial shipyard in San Francisco and the largest privately operated ship repair yard in the country, built more than 50 Navy combat vessels during the last war, overhauled 31 submarines, and repaired more than 2500 vessels of all types.

Navy vessels, which have to be built to the most exact specifications, utilize alloy steel to a great extent. Bethlehem nickel-chromium steel, a combination which produced a steel having the benefits of the added strength of both alloys, is used for gun mount bolts. Bolts made of this alloy are now generally used throughout industries where parts are subjected to unusual operating conditions. Examples are also seen at this yard today in a large number of ship repair operations.

Carbon molybdenum steels are used extensively in high pressure steam and feed lines which are operated at temperatures in excess of 7500° F. temperature and 600# per square inch pressure.

Molybdenum is used as an alloy in steel because it imparts definite benefits upon subjecting the steel to heat treatment. At present its most general use is mainly to enhance the desirable properties of other alloying elements such as manganese, nickel, or chromium, and nickel with chromium, all of which with the addition of a relatively small percentage of molybdenum show an improved response to heat treatment.

Valves, fittings, bolting material, etc., must necessarily be of alloy manufacture to withstand rugged sea service. Valve trim such as seats, stems, and discs are often made from stainless. Feed pump casings are now being made from 18-8 to withstand erosion caused by the water. Super-heater tubes and headers operated at 900° F. are made from carbon-chrome-moly steel. Turbine rotor blades, manufactured in Bethlehem's Quincy Yard, are made of stainless iron. Temperature of the high pressure units is generally 800° to 850° F. Steel castings for the turbines also made at this yard are made of C-Mo steel. Tail shafts and couplings on Navy vessels utilize alloy steel. These operate at 400 rpm. Coupling bolts for the main shaft as well as the high pressure turbine joint bolts are alloy products.

Strength at high temperature is vital in the parts just enumerated and alloy steel is mandatory for this work.

Other parts such as reduction gears, where wear, pitting and resistance to fatigue are essential, require the use of alloy steel.

Vanadium alloy steels are used for rams and machine tool parts, many of which are made right at the San Francisco Yard. Vanadium acts as a deoxidizer. Its effect on the physical properties of a heat-treated steel is to promote ductility and accentuate the benefits of other alloying elements such as manganese and chromium.

Other types of Bethlehem alloy steels used in the company's San Francisco and other West Coast yards include alloy #2 for boiler studs; class A nickel for boiler studs and bolts; stainless steels for valves and rings or any parts subject to rust; and Mayari-R, a low alloy steel with a high tensile strength and anti-corrosion qualities. This latter steel is used to line fish hold tanks in Pacific Coast commercial fishing vessels.

The special demands in many instances found in the shipbuilding and ship repair industry can only be satisfied with an alloy product.

Quick Repairs Are Important

WHEN CARGO AND PASSENGER SPACE on vessels plying between the West Coast and points in the Pacific and Far East is so scarce—and from all present indications this condition is likely to continue—it is extremely important to shipping operators that their vessels be returned to service from repair lay-up as soon as possible.

Bethlehem Steel Company's San Francisco Yard is helping these operators realize this by performing repair jobs in minimum time. A typical example can be taken from the case of the SS Hoegh Silvercloud, 5287-ton combination freighter and passenger vessel. The main water cooler housing for this vessel's diesel engines cracked and became unserviceable while the vessel was at sea.

The entire water cooler and housing were removed from the Silvercloud at Bethlehem's San Francisco Yard. Here it was found that to duplicate the cracked housing in its original form as an iron casting would take 56 days normal delivery and 21 days forced delivery. Furthermore, if the housing were to be in the form of a casting, the risk would be run that the casting might be imperfect, causing further delay. It was finally decided to fabricate a new housing of steel. This was done in considerably less time than was estimated for the casting.

Specifications called for the housing to be 5 feet 7 inches long with an inside diameter of 36½ inches with flanges on each end finished to a thickness of 1¾ inches. Five pockets for fresh water circulation had to be fabricated and welded on each side of the cylindrical shaped housing. The cylinder itself was formed from one plate rolled in the shape of a half circle and welded together. The flanges were welded on each end.

The entire fabrication job was handled in the Yard's Plate Ship, following which it was stress relieved, sand blasted, and then removed to the Machine Shop. Here the interior of the housing was machined on the shop's boring mill. The flanges also were machined and 15/16-inch diameter bolt holes were drilled and spot faced. The entire unit was then hot dip galvanized.

A large tube nest for circulating salt water was then installed in the housing. This was equipped with fresh water baffles.

Final operation before installation of the completed cooler in the vessel consisted of first testing the tube nest under a 75 pound per square inch water pressure and then the housing itself under the same pressure. Upon successful completion of its tests both the inner and outer tube nest heads at each end of the housing were bolted into place.

The Admiral Hugh Rodman, a P2-SE2-R1 troopship before conversion by Transportation Corps.

The Army's Ship Conversion Program

Army Week Reminds Us of Its Importance

WHEN THE NATION PAYS TRIBUTE during Army Week, April 6-12, to the men and women, living and dead, who contributed so much while in the service of their country, ship repair yards on both coasts will be reminded of the valuable service they are rendering the Army in their program of postwar ship conversion.

With the cessation of hostilities on both global fronts, there was demanded of the Transportation Corps, a mass movement of troops back to state-side, which in magnitude far surpassed any such previous movement. The Transportation Corps' fleet, aided greatly by vessels of Navy and War Shipping Administration, returned to states in the six months, August 1, 1945, to January 31, 1946, a total of 3,762,868 persons. This figure does not include outbound load which in itself was tremendous, namely, 817,968 persons in the same 6-months' period.

While this mass movement of personnel was being expeditiously handled, a plan for development of a postwar Army transport fleet was in the making. The basic vessels covered by this plan were the 610′ P-2 type vessels and the 523′ C-4 type vessels. These vessels had been built as troop ships by the Maritime Commission but had been previously operated by Navy and Coast Guard. The first of the basic group was transferred to to the War Department on February 28, 1946, and the last vessel on June 21, 1946. A total of thirty-six vessels was involved as follows:

Twenty-five of the C4-S-A1 type (single-screw, geared turbine drive) built at Kaiser Richmond Ship Yard No. 3, Richmond, California.

Eight of the P2-SE2-R1 type (twin-screw, turbo-electric drive) built at Bethlehem Alameda Ship Yard, Alameda, California.

Three of the P2-S2-R2 (twin-screw, geared turbine drive) built at the Federal Ship Yard, Kearny, New Jersey.

All vessels, upon delivery to the Transportation Corps, were immediately placed in conversion yards and the first phase of this major two-phase program was initiated.

It might be well here to point out the necessity for splitting the program into two separate and distinct phases. At the time the 36 vessels were undergoing first phase conversion, the transportation requirements of the War Department had reduced to a point where, for a time, the vessels undergoing conversion could be released from service and the entire load handled with other miscellaneous vessels of the War Department and War Shipping Administration fleets. This latter group of War Department vessels, however, could not be counted on as permanent troop ships as many were required to be returned to private operators, many were old vessels, and others were of a type which could not be considered desirable as permanent additions to our fleet. With this condition in mind and with a desire to release this latter group of vessels from active service with the least possible delay, it was considered desirable to separate the conversion program into two supplemental phases, the first phase of which would cover only that work necessary to allow the vessels to return as soon as possible to service fitted with minimum requirements of a postwar Army transport, and the second phase covering the balance of the permanent conversion features. How well the time saving feature of this plan succeeded is indicated by the fact that the first of the converted vessels re-entered service by May 27, 1946, and all vessels were again in service by November 1946. The first phase of conversion consisted of changing the crew quarters, troop quarters, passenger quarters and life boats, and effecting necessary repairs.

Crew Quarters

As all of the thirty-six vessels had been previously operated by either the Navy or Coast Guard, the crew quarters on the vessels were entirely inadequate to meet requirements of a civilian crew. In addition, the enlisted men of the Navy or Coast Guard crews had messed with the transient troops in the usual cafeteria style and new messrooms and pantries were required for civilian crews which, in accordance with current marine practice, must be seated and receive table service during regular meal hours.

The new required crews' quarters were developed in accordance with latest maritime regulations and in such a manner that the least amount of re-arrangement will be necessary during second phase conversion. Ships' officers, in general, are berthed top sides in one and two-man rooms, the crews being quartered in well lighted and ventilated two, four, and six-berth rooms.

New crew messrooms and pantries were fitted as required and so located as to concentrate the culinary activities in order to achieve the maximum efficiency of the Steward's Department.

The ships as converted provide crew accommodations which should go far in reducing shipboard personnel turnover and in making for happy, comfortable, and satisfied crews.

Troop Quarters

During the war years, shipboard comfort of troops in transit was considered, within certain limits, as secondary to the task of transporting them safely in the large numbers required by the various theater commanders. Troop berths were stacked four and five high with small aisles between berths. The chief consideration of the Transportation Corps during the first phase conversion was to reduce overcrowding in troop areas. Troop berths

The Admiral E. W. Eberle, a sister vessel of the Admiral Rodman, after conversion by the Transportation Corps were limited to three high, undesirable berthing locations were converted for other purposes, slight changes in lighting and ventilation were accomplished all in an effort to make troop spaces as comfortable as practicable.

Minor rearrangements were accomplished in troop mess spaces to speed up serving and to insure that each man was fed three healthful and satisfying meals a day. Troops are fed cafeteria style using five-compartment mess trays which when emptied are passed through mechanical washers in order to make certain that each tray is physically and biologically clean before its next use.

The troop capacity of each vessel was materially reduced and the distinctly uncomfortable overcrowding conditions of war days no longer exist.

Passenger Quarters

As the War Department is required to transport families of its officers and troops as well as civilian governmental employees, quarters for this type of passenger were a necessity. During the first phase conversion, troop officer spaces and other available spaces were fitted for this purpose. New fire-resistant, Class "B" stateroom bulkheads were installed, comfortable berths fitted and private, semi-private, and public toilets were located throughout passenger areas as required. In certain of the vessels, larger spaces were fitted as dormitories for junior officers, single members of families or male civilian employees. While the quarters can in no manner be compared to prewar stateroom space, the outfitting, location, ventilation, and lighting is adequate to insure the comfort of all quartered therein.

The old troop officers' mess rooms were utilized for the saloon mess with provision for serving three meals a day to all cabin passengers.

While the second phase conversion contemplates for all cabin passengers, a high standard of accommodation, the first phase conversion has covered the installation of the fundamental facilities and provides for a limited number of passengers in quantities as listed below:

C4-S-A1	136 Passengers
P2-SE2-R1	302 Passengers
P2-S2-R2	139 Passengers

Life Boats

The eight vessels of the P2-SE2-R1 class at the time of their transfer to the War Department, were fitted with only two sets of davits under which were stored the emergency boats. The War Department felt that such lack of life boat capacity could not be condoned in peacetime use and on each of the eight vessels of this class, six sets of gravity davits were installed. Under each set of davits, a 35′ 135-passenger life boat was fitted together with necessary life boat handling winches.

Repairs

During the conversion period all vessels in the program were drydocked and any necessary underwater repairs completed. All vessels were painted in Transportation Corps colors and the well-known red, white, and blue Army Transport Service stack bands again made their appearance. All hull structural repairs found necessary were accomplished and all machinery and equipment was given thorough overhauling.

Severe war service by these vessels had precluded the usual attention to machinery maintenance and engine and fire room repairs were found to be extensive.

All boilers were opened, cleaned on both fire and water sides, furnace brick work was renewed or repaired where necessary, and tubes re-rolled or new tubes fitted. All boiler mountings were examined, boilers hydrostatically tested and passed by the U. S. Coast Guard Vessel Inspection Service. All turbines and gear covers were removed, units cleaned, necessary repairs accomplished and units closed. Auxiliaries, blowers and mechanical equipment throughout each vessel were opened, inspected and thoroughly overhauled. Each vessel was given a dock and sea trial before being placed in active service to insure its seaworthiness and satisfactory mechanical condition.

In the case of the eight P-2 vessels which are turbo-electric drive, reverse current relays and voltage regulators were fitted to insure safety of main propulsion units under all maneuvering conditions.

The repairs were accomplished concurrently with conversion work so that "out of service" time of the vessels was held to a minimum.

In addition to the major groups of work described above, the conversions of these vessels entailed work on thousands of lesser items such as fire detecting and extinguishing system, rearrangement of radar installations, installation of general alarm systems, overhauling and rearrangement of cargo gear, life saving gear, etc., all of which work was required in the development of these war time built troop ships into safe and efficient postwar troop transports.

In addition to the twenty-five C-4 and eleven P-2 vessels which underwent first phase conversion as indicated above, additional conversions were accomplished on special C-3 type troop ships, the Frederick Funston and James O'Hara, and three C1-B hospital type ships, the Hope, Comfort and Mercy. In general the work on these vessels consisted of installation of civilian crew quarters, overhaul of hulls and machinery, and minor modifications in way of passenger spaces to fit the vessels for demands of postwar service.

Another interesting chapter of the War Department conversion story involves three ex-Navy vessels, the Tryon, Rixey and Pinkney. These combination assault and hospital vessels were built by the Moore Dry Dock Company in Oakland, California, and were originally intended for service with Alcoa Steamship Company. However, prior to completion they were altered for Navy service and served with distinction in the Pacific during

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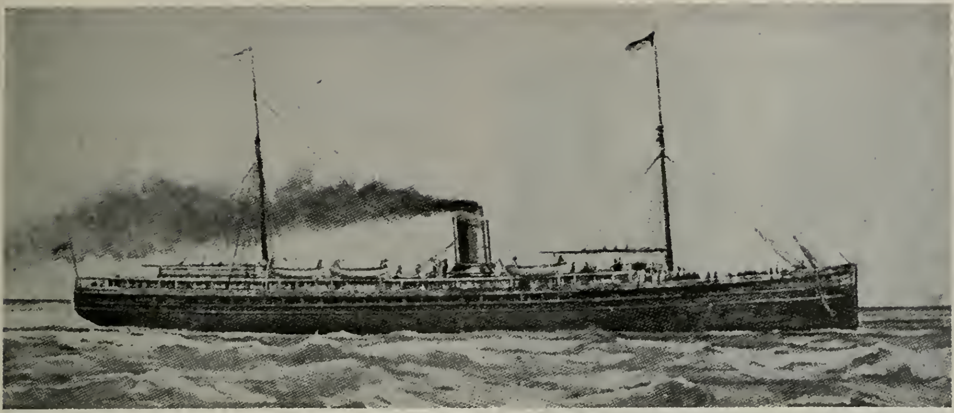


Steamship Columbia from a drawing in Gleason's Pictorial of the late Nineteenth Century.

Pacific Merchant Marine Gave Edison His First Lighting Installation

LAST MONTH (FEBRUARY 1947) was the 100th anniversary of the birth of Thomas Alva Edison, a great American citizen who was the despair of his school teachers during his early years, a great grief to his bosses during youth, and suddenly developed into the greatest inventor that America, and possibly the world, has thus far produced. He is getting much merited acclaim from the daily press and from technical journals all over the world, even to giving him credit for everything that marks the United States as a prosperous, industrial and manfacturing nation, which of course, is ridiculous.

In the midst of all this eulogy and fulsome praise, we wish here to again record and emphasize the fact that it was a Pacific Coast shipowner, a Pacific Coast steamer, and a Pacific Coast marine engineer, in combination, who gave to Edison the first big boost in connection with the practical application of his electric incandescent lamp, his shunt wound constant voltage generator, and his parallel wiring system.

In 1879 there was building at the famous John Roach shipyard, Chester, Pa., an iron steamer, christened Columbia, for the account of the Oregon Railway and Navigation Co., and to be used by them in the Pacific Coastwise trade between Portland, Oregon, and San Francisco. President Henry Villard, of the Oregon firm, was in New York late in 1879 and was intrigued by the announcements of Edison's discovery of the practical application of the incandescent electric lamp. He went out to Menlo Park, N. J., and was much impressed by what he saw there and by Edison's personality. He was also very much in favor of the advertising value of having the first steamer with electric light. So he gave Edison an order to wire the Columbia for lights and install an electric generating system thereon.

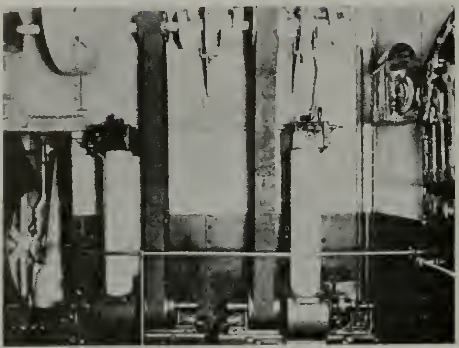
Edison at this period, was under much adverse criticism because premature publicity had not been followed by promised performance and the big New York dailies were beginning to suspect that he was working the market on shares of the then just-formed Edison Electric Illuminating Co. This order to equip an American passenger steamer was the first tangible evidence of business confidence in Edison's proposed electric light system and came before he had perfected the carbon filament for his lamps.

The inventor and his friend Villard, found themselves immediately in conflict with the conservatism of John Roach, then the great shipbuilder of the United States. This shipbuilder refused to have the electricians do any work on the ship while the vessel was in his yard, so the job had to wait until she was moored alongside a New York Dock and having her hotel equipment installed.

There, Edison's workmen and the chief engineer of the Columbia, Oliver Van Duzer, wired the steamer as told in the letter reproduced below, and installed four Edison bi-polar constant voltage generators and a pair of vertical steam engines to run these generators.

The Columbia had a long and useful career on the Pacific Coast. Between her arrival at Portland on July 22 and her lay-up for complete overhaul in 1895, she had

Dynamo Room, SS Columbia



The first commercial installation of the Edison lamp, started May 2, 1880. One of these original dynamos is on exhibition at the Smithsonian Institution.

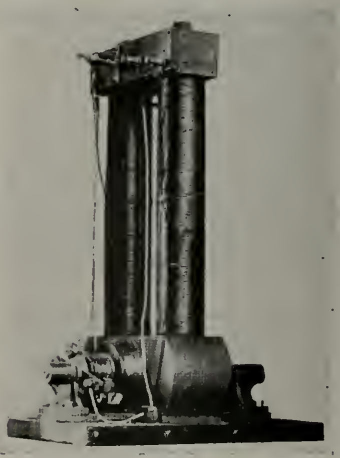
made over 400 round trips between San Francisco and the Columbia River. She was thoroughly overhauled at the Union Iron Works (presently Bethlehem San Francisco yard) in 1895 and at that time her original Edison generator plant was removed and a more modern plant installed. This was a U.I.W. generator direct connected to a U.I.W. compound vertical engine. The Edison generators were distributed to various museums and other institutions. The one sent to the Smithsonian is depicted in one of our illustrations.

A letter to Edison dated 1882 and written by the port engineer of the Oregon Railway and Navigation Co., was used by the Edison Electric Illuminating Co. in much of their early advertising as proof of the long life of the Edison incandescent lamp. This letter, in part, read:

> "In 1879, while the Columbia, which contains a large number of passenger rooms, was under construction, President Villard conceived the idea of lighting each room in the vessel independently by the electric light. Thereupon, at your suggestion and by his orders, I wired the ship with No. 11 wire for mains and No. 32 wire for loops, insulated by double cotton paraffine and painted over all. The wires run throughout the entire vessel, but the project at that time being experimental, we lighted only the passenger rooms and main saloons. The dynamos, of which we had four, one of them running at half the speed of the others as an exciter or fielder, were of the class you now call "A," and were all run from a countershaft directly overhead, driven in turn by a pair of vertical engines at a very high angle in order to economize freight space. On the night of the 2nd of May 1880, we started up the dynamos, and from the time when the steam was first turned on until the present day they have worked to our entire satisfaction under all circumstances.
>
> "We found the light of the greatest value for the examination of the ship's propeller, rudder or hull, which examinarion we conducted by connecting to a main line aft, or at any convenient point, a coil of insulated wire with lamps attached to a sinker.
>
> "The first lamps used, being of the paper carbon variety, were irregular in their duration of life and so liable to breakage by heavy shocks that I found it best to suspend them from the wires above, and to do away with the sockets entirely. The lamps being surrounded with a ground globe, the attachment was hid, the lamps being suspended from the ceiling. Since the arrival of the ship on the Pacific coast we have received a full supply of new bamboo carbon lamps. How well these have worked can best be seen from the following report of the Chief Engineer Van Duzer: 'I have now one hundred and fifteen lamps in circuit, and have, up to date, run four hundred and fifteen hours and forty-five minutes without one lamp giving out.'"

The Columbia has long ago gone to her rest as has Edison, but let it not be forgotten that this Pacific Coast steamer carried the first commercial plant of electric incandescent lighting ever installed on earth and that she pioneered the marine use of electricity which has now become such an important factor in the world's marine engineering practice.

Edison Dynamo, 1879



Edison made a dynamo that was 90 per cent efficient which scientists said was impossible. This dynamo is in the collection of the Smithsonian Institution and was one of the machines on the Columbia, the first commercial installation of the Edison lamp.

Reblading Turbines At San Francisco

IN WHAT REPRESENTS a painstaking and exacting piece of work, one which is not frequently found being done in Bay Area ship repair yards, Bethlehem Steel Company's San Francisco Yard is currently engaged in reblading both the high pressure and low pressure turbines of a T-3 tanker the company built in 1943 at its Sparrows Point Yard. The vessel is the SS Cornell, 487 feet long and 10,180 tons. Her two turbines were built at Bethlehem's Fore River Yard in Quincy, Massachusetts.

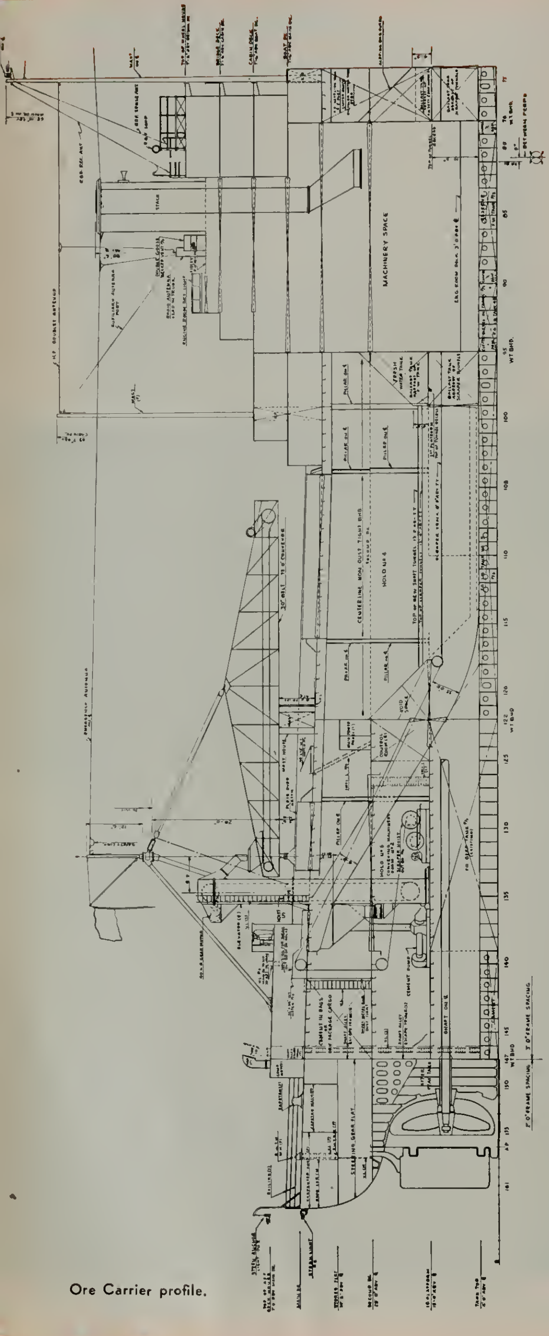
Because of the experience it has gained in reblading and repairing steam turbines, plus the technical know-how, the San Francisco Yard is placed in an enviable position for performing a job requiring such skill.

It became necessary to reblade the low pressure tur-

(Please turn to page 136)

At top, left: Checking rotor from Low Pressure turbine for trueness prior to removing blades. Right: Reblading lower half of LP casing.

At bottom, left: Installing labyrinth packing in backing turbine diaphragm. Right: Installing blading segments in LP rotor



Ore Carrier profile.

A NEW

A VICTORY TYPE CARGO STEAMER is now being converted into a self-unloading combination bulk cement and other rock carrier by the Kaiser Company at Swan Island Yard, Portland, Oregon, for the Permanente Cement Company.

The main characteristics of the converted vessel will be:

Length Overall	455′—3″
Length B. P.	436′—6″
Beam Molded	62′—0″
Depth M. D. Molded	38′—0″
Draft Molded S. L. L.	28′—6¾″
Light Ship Meandraft	9′—8″
Displacement Loaded	15,210 tons
Displacement Light	4,430 tons
Total Deadweight	10,780 tons
Cargo Deadweight	8,676 tons

In general, the platform decks in Holds Nos. 2, 3, 4 are being removed and these spaces changed into hoppers, port and starboard, with 45° angle bottoms so arranged that they converge into the scraper tunnels. Holds Nos. 1 and 5 are arranged to house: the machinery operating the scrapers and conveyors; the cement pumps, and the discharge hoppers. The cargo is discharged from the hold hoppers into one of the tunnels and conveyed by scraper system to the forward or aft discharge hopper from which it is discharged to Fuller-Kenyon cargo pumps—if cement, or to a conveyor system—if miscellaneous rock. Scrapers are Sauerman Bros. crescent type each having a capacity of 6 cubic yards. These scraper systems will each be operated by a Clyde Iron Works hoist, one operator manipulating two hoists and their scrapers. One scraper system has more than enough capacity to feed one cement pump. Operation of the scrapers is handled from a control room with pneumatic controls.

The two cement pumps with the help of four Fuller air compressors are to be capable of handling a total of 8000 cu. ft. or 376 short tons of cement an hour and discharging it ashore through 1000 feet of flexible pipe.

BULK CEMENT CARRIER

The Link Belt rock conveyors consist of vertical bucket elevators discharging onto boom conveyors, which discharge outboard port or starboard, and are designed to handle a total of 500 short tons of bulk miscellaneous rock an hour.

A large amount of structural work is involved in compensating for the portions of hull removed and for the extra strains imposed by this handling machinery. This structural work includes: the removal of large parts of the platform decks in way of holds No. 2, 3 and 4; the removal and decking over the weather deck hatches 2, 3 and 4; the construction and installation of dust tight steel bulkheads to form new sides and 45° bottoms for holds 2, 3 and 4; the construction of the four scraper tunnels mentioned above, and the cutting and fitting of their access through bulkheads; the construction and fitting of access hatches and ladders for the machinery spaces in holds No. 1 and No. 5; the fabrication and installation of suitable deck piping for cement loading and suitable discharge piping for cement unloading pumps; the fabrication and installation of ventilating ducts for the machinery spaces and for the scraper tunnels; and the construction of reinforcing transverse arches and compensating structural members in various parts of the ship.

There are four scraper tunnels in the ship. Two forward 10 feet outboard from center line port and starboard and two aft 12 feet 9 inches outboard from center line port and starboard. These tunnels have an inverted V roof in way of the cargo hoppers changing into flat roof as they enter machinery spaces where they incline upward as a ramp carrying the scrapers to the top of the discharge hopper. Doors in the sides of each tunnel allow the cement to discharge from the hopper holds by gravity.

Electric power for the cement pumps, for the air compressors, and for the rock conveyors is taken from the shore through three shore box connections to control panels in the machinery spaces. Each cement pump takes a 350 hp motor and each compressor a 200 hp motor. Each bucket elevator takes a 40 hp motor and each boom conveyor a 15 hp motor. Interlocking electric controls prevent any dangerous piling up of cargo on either the cement pumping system or the rock conveying system.

Cement is loaded by shoreside pumps assisted by compressed air and discharging to the holds by deck piping. This air is discharged from the cement hold hoppers through dust arresters of the bag type. One such arrester is located aft to take care of the discharge air from the cement tanks in Hold No. 4 space. The second arrester is located over Hold No. 3 and takes care of the air discharge from the cement tanks in the space formerly occupied by holds No. 2 and 3. Each arrester is fitted with an electric bag shaker. Their combined capacity is 6000 cfm of air and they will normally collect 35 tons of cement dust during one loading operation.

The deck piping system for cement loading and unloading are specified seamless drawn steel pipe 10″ inside diameter. All bends are made to a minimum radius of 8′—0″, all joints are dust tight and those on the weather deck watertight, and all connections self cleaning. The discharge of the loading pipes into the holds is through deck terminal boxes, and these boxes are fitted with removable wearing plates. The cement piping is tested for 100 psi air pressure.

A mechanical ventilation system of the exhaust fan type is being fitted in each of the cargo machinery spaces. Four Sturtevant design "Silent Vane" fans, each driven by a 5 hp motor and each having a capacity for delivering 10,000 cfm at 1½ in. water static pressure. These systems will change the air every 4 minutes in the compartments they serve.

Accommodations

Considerable change is being made in the crews quarters to accommodate a nice suite of rooms for the owner. A complete clean up and paint job is being done so that this vessel, when delivered to her owners, will be complete and practically new in every detail.

Five Million Tons Salvaged

By G. W. L. DAY, British Feature Writer

A GREAT MANY FOUNDERED VESSELS round Britain's coasts have been refloated and towed into harbor; but the rest whose twisted frames are beyond repair are now being disintegrated with high explosives to clear the sea-routes. Though the work of refloating wrecks is practically complete, there are still some 500 wrecks to be dispersed, and the men of the Admiralty Wreck Dispersal Department will probably be hard at work for another three years.

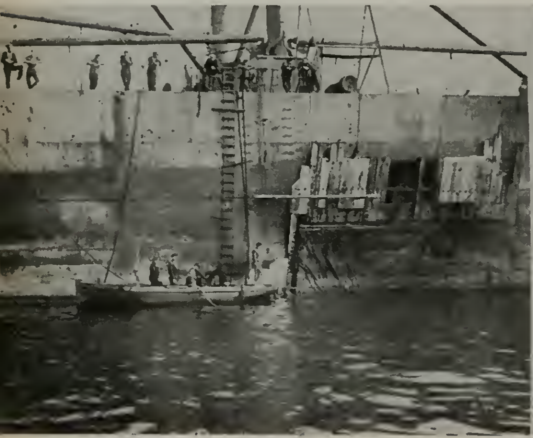
Before the war, marine salvage was a declining industry in Britain; there were less than half-a-dozen salvage vessels in commission and only a handful of professional salvage officers. When war came, there were more shipping casualties in need of first aid in the first three months than there had been in the previous ten years. All manner of odd ships were requisitioned and quickly converted, and eventually a huge organization came into being with ships and bases extending even to the Pacific. At the end of the war there were about forty salvage ships in commission, manned by highly trained crews and carrying a great deal of special apparatus, much of which had been invented and developed in the previous six years. Today a good many of these ships have been paid off, but there are still about 18 modern trawlers fitted up for wreck dispersal work, each with a crew of 34.

Wartime Technique

During the war, widely varying methods and technique had to be used to meet the very diverse conditions. For instance, in the coastal waters of Britain the lifting and removal of wrecks was helped by the tides, whereas entirely different equipment had to be used in the tideless Mediterranean. It was no uncommon sight on the beaches of Italy and Sicily to see bulldozers clearing a launching way for a stranded craft, or tracked Army vehicles hauling vessels down to the water. Round the shores of Britain a temporary timber patch over damaged side plates was sufficient first aid for towing a damaged vessel into port, but for a voyage from Iceland or North Africa to a dry dock in the United Kingdom, a major operation had to be performed.

Faced with an unparalleled emergency, special salvage craft had to be designed and constructed at a moment's notice. Exactly what constitutes an ideal salvage vessel

A British merchantman, claimed by the German radio to have been sunk in the North Atlantic, sailed all the way from the Azores with a makeshift concrete patch 45 feet by 32 feet over the hole made in her side by the torpedo.



The sort of obstacles that clutter European ports. This picture was taken in the port of Gaeta on the West Coast of Italy, 60 miles south of Rome.

has always been a matter of controversy. Sir Frederick Young, Chief of Britain's salvage section in the last war, described it as one which would float on the dew of a meadow! So many different sorts of work have to be carried out under so many different conditions that a salvage vessel is of necessity a compromise between the elements of speed, endurance, draft, bow lifting capacity, derricks, hold space and towing ability.

The Admiralty ordered two new types of salvage tug, (one ocean-going and one coastal), three types of special lifting craft to work in pairs, and a submersible pontoon or camel with a lifting capacity of 80 tons.

Special salvage equipment was also invented and put into use. In 1939 there came into operation a new type of submersible pump for draining, which is driven normally by a portable air compressor delivering air at 100 lbs. per square inch pressure. This compressor also can be used to drive pneumatic tools above and below water, portable air winches, or the ships steam cargo winches.

Some researches have been made into the possibilities of using a mixture of helium and oxygen, or helium and air, for deep-water diving. A new electric oxyarc cutting torch was invented, and an electric arc process for underwater welding.

Another notable invention was the Cox submerged bolt driving gun. This ingenious apparatus is used both for welding and for firing a hollow bolt into the side of a ship's compartment so as to introduce compressed air, and it punches holes far more quickly than the ordinary pneumatic drill. It was used in the war by divers to drive screwed studs and bolts into the hull plating for the purpose of securing a patch of steel or wood. It was also employed with great effect for the rapid repair of tanks and armored cars on the battlefield.

Such appliances make it necessary for divers to be much more skilful and highly trained than ever before This is a point made by our salvage officers who worked with the American Salvage Corps and were very much impressed with their thorough training and exceptional skill.

Another striking development which saved many a ship is the use of compressed air on motor tankers to keep the ship afloat after it had been mined or torpedoed. The Admiralty carried out a great deal of successful experimental work with compressed air in salvage damaged tankers which were in danger of sinking. Then in 1940 the Eagle Oil Shipping Company began to fit all its motor tankers with the additional stand-by compressors under the forecastle head, connected to the compressors in the engine room. It was not long before a U-Boat torpedoed one of these tankers, holing 14 out of her 27 compartments and flooding both pump rooms. But the compressed air system kept her afloat on a voyage of several hundred miles to dry dock, and after this a great many Allied tankers were fitted with the device.

Salvage 5,000,000 Tons

Some of the damaged ships subsequently towed into dry dock were a curious sight. On occasions it was no more than half ship. There were hogged ships, sagged ships, ships without bottoms, and even the two halves of a ship floating but almost separated.

Picture taken at Algiers in December, 1942, shows the British cruiser Delhi. Since then she was repaired and fought through the war.

Between September 1939 and December 1944, the salvage and rescue tug service saved more than 5,000,000 tons of merchant shipping, which is about equal to the tonnage of new merchant ships built in the United Kingdom during the same period. The need for salvage was certainly desperate. From the beginning of the war to the end of 1943, 11,500,000 gross tons of merchant shipping were lost, as against an existing pre-war tonnage of 17,500,000.

Owing to the tremendous development of bombing and mine-laying which made it comparatively easy for enemy aircraft to block ports by sinking ships in the fairways, the Admiralty salvage fleet was faced with a new task on the outbreak of war. One of the first calls made on it was to keep the London docks clear of obstructions during the terrible blitz of 1940. Work had to continue night and day without interruption and divers had to go down in the fouled and muddy water of the docks and river even during raids. Bombs had penetrated deep into the river bed: the water was thick with evil-smelling decaying matter, and the visibility was almost nil.

At another of Britain's ports in 1941, no less than nine sunken vessels were raised in 13 days. In Dover harbor divers worked with shells and bombs falling, with ships on fire nearby, and with a thick covering of oil on the water.

From 1942, harbor clearance became one of the major

(Please turn to page 127)

The SS Donbass, III, former Russian tanker which broke in two last February in the North Pacific, being operated by the Pacific Gas & Electric Company to augment the power supply of the fast-growing Humboldt area, by using the ship's main propulsion equipment.

Electric Power From Salvaged Ship

AN INGENIOUS SOLUTION to postwar shortages of both manufactured and construction material is a beached ex-tanker which Pacific Gas & Electric Company put into operation as a power plant at Eureka, California, augmenting the company's power supply to keep pace with the growth of the Humboldt area. The power plant was put on the line December 28, 1946.

The stern half of the SS Donbass III, former Russian tanker which broke in two last February in the North Pacific, has been berthed on the Eureka waterfront in Humboldt Bay and its General Electric engines originally designed and installed as the main ship propulsion equipment, now pour 6700 horsepower of electric energy into the company's local distribution system. The propulsion on the Donbass consisted of a marine-type GE steam turbine turning an electric generator, which supplied electric power to the ship's electric propulsion motor. At Eureka, the power company takes its electrical energy direct from the turbine.

P. G. & E. recently purchased the after-end of the Donbass from the U. S. Maritime Commission, and a former Navy seagoing tug towed it from Seattle to Eureka where it was prepared for operation. A bank of transformers has been installed on the dock alongside the Donbass and feeds the power directly into a 12 Kv transmission line.

The SS Donbass, formerly the American SS Beacon Rock, was built in 1944 at the Swan Island Shipyards, Portland, Oregon, and was operated under lend-lease by the U.S.S.R. During the war the Russians hauled aviation gas and other fuel in the tanker and carried deck loads of American-built airplanes and tanks. She ran from Pacific coast ports through the Bering, Okhotsk and Japan seas to Vladivostok.

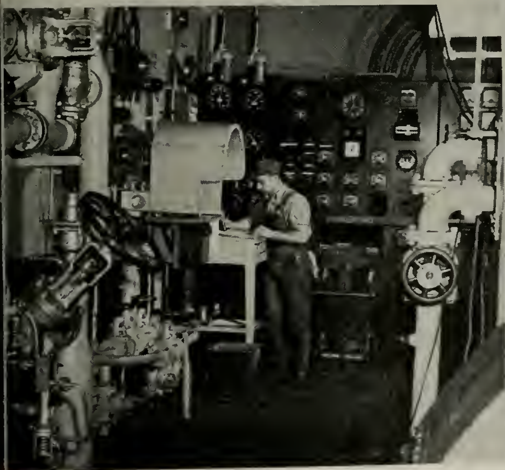
The Donbass suffered her disaster on February 17, 1946. The ship's master and 14 crewmen, all Russians, were lost. Five days later the SS Puente Hills, a Marinship tanker operated by the War Shipping Administration, found the ship after sighting her distress flares, put a tow line aboard her and began a 21-day salvage operation, much of it through stormy seas, bringing her safely to Port Angeles, Washington.

The Puente Hills' crew claimed the Donbass as a prize and their claim was upheld in Federal Court. At a U. S. Marshal's sale, the War Shipping Administration, actual owner of the Donbass and also of the Puente Hills, paid $110,000 to buy its own ship. The purchase price established the prize fund for the Puente Hills crew and operator.

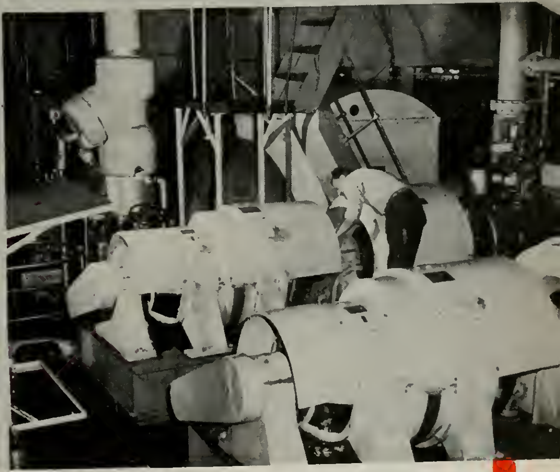
The Pacific Gas and Electric Company purchased the Donbass for $125,000, being the successful bidder in a sale held by the U. S. Maritime Commission.

Transmission lines on the SS Donbass at Eureka rigged to carry off power to the main system via transformers installed on the dock.

The stern half of the SS Donbass III being towed to dock at Eureka, California.



Charles R. Mossman, utility man, standing in front of main control panel on the SS Donbass. Meters indicate that unit is under load.



John J. Barr, operator on the SS Donbass, looking over one of the 525 kw generators which furnish excitation for the main generator.

Merchant Fleets of the

Number, Gross and Deadweight Tonnage of Seagoing Steam and Motor Merchant Type

(EXCLUDES VESSELS ON THE GREAT LAKES AND INLAND WATERWAYS AND SPECIAL TYPES, SUCH AS

	VESSEL TYPE								
	TOTAL			COMBINATION PASSENGER AND CARGO			COMBINATION PASSENGER AND CARGO REFRIGERATED		
	No.	Gross Tons	DWT Tons	No.	Gross Tons	DWT Tons	No.	Gross Tons	DWT Tons
GROSS TONS—Total	12,445	71,000,408	99,219,900	936	6,279,393	4,678,400	52	501,076	407,200
1,000 but under 2,000 Gross Tons	2,023	2,998,938	4,317,300	218	312,877	256,900	5	6,601	6,700
2,000 " " 4,000 " "	2,225	6,616,097	9,501,800	224	652,813	573,600	4	13,047	10,100
4,000 " " 6,000 " "	1,591	8,043,027	12,312,200	131	649,606	623,400	4	18,348	14,500
6,000 " " 8,000 " "	4,826	34,486,357	49,356,900	94	657,230	619,600	12	82,410	60,000
8,000 " " 10,000 " "	810	7,094,863	9,596,900	78	699,897	670,100	7	63,622	59,300
10,000 " " 15,000 " "	857	9,292,212	12,845,900	89	1,050,885	838,700	13	173,638	153,100
15,000 " " 20,000 " "	65	1,107,997	697,800	58	995,283	588,500	4	65,141	49,000
20,000 " " 25,000 " "	27	584,437	313,000	26	562,591	284,000			
25,000 " " 30,000 " "	12	322,308	167,800	9	244,039	113,300	3	78,269	54,500
30,000 gross tons and over	9	454,172	110,300	9	454,172	110,300			
DEADWEIGHT TONS—Total	12,445	71,000,408	99,219,900	936	6,279,393	4,678,400	52	501,076	407,200
Under 2,000 Dwt.	908	1,342,283	1,322,500	296	605,381	342,900	6	9,072	8,500
2,000 but under 6,000 Dwt.	3,531	10,089,138	13,012,300	289	1,268,774	1,026,000	17	99,060	67,900
6,000 " " 8,000 "	964	5,364,287	6,756,500	109	914,759	761,400	3	20,468	19,500
8,000 " " 10,000 "	1,556	10,010,054	13,895,600	117	1,460,883	1,054,400	10	123,133	88,700
10,000 " " 13,000 "	4,538	33,970,953	48,954,900	93	1,262,554	1,019,100	5	51,990	55,600
13.000 " " 15,000 "	234	2,455,744	3,267,800	20	390,780	269,900	8	119,084	112,500
15,000 " " 18,000 "	651	6,982,913	10,747,500	10	337,778	166,300	2	51,114	31,800
18,000 Dwt. and over	63	785,036	1,262,800	2	38,484	38,400	1	27,155	22,700
SPEED—Total	12,445	71,000,408	99,219,900	936	6,279,393	4,678,400	52	501,076	407,200
Under 10 Knots	1,853	4,394,905	6,758,000	61	114,593	112,600			
10 to 12 Knots inclusive	7,340	40,431,350	60,208,700	292	944,454	1,022,600	4	17,378	15,100
13 " 14 " "	1,472	10,835,818	15,786,600	240	1,232,294	1,152,500	18	119,514	107,700
15 " 17 " "	1,629	12,958,986	15,159,200	225	1,932,897	1,457,700	27	285,915	229,900
18 " 20 " "	118	1,528,499	1,013,600	88	1,282,574	693,700			
21 " 25 " "	29	587,694	236,800	26	509,425	182,300	3	78,269	54,500
26 Knots and over	4	263,156	57,000	4	263,156	57,000			
YEAR BUILT—Total	12,445	71,000,408	99,219,900	936	6,279,393	4,678,400	52	501,076	407,200
Prior to 1916	1,573	4,998,158	6,737,800	280	1,161,901	970,200	6	48,012	48,200
1916 " 1920 inclusive	1,403	5,707,428	8,608,600	64	343,393	333,900	6	42,814	35,700
1921 " 1925 "	1,077	4,792,698	6,520,400	161	1,197,504	1,056,200	16	148,288	134,900
1926 " 1930 "	952	4,794,920	6,207,100	193	1,251,562	871,600	11	115,605	83,800
1931 " 1935 "	399	2,303,833	2,742,200	83	720,369	445,100	8	50,417	33,600
1936 " 1940 "	942	5,424,749	7,219,500	104	998,588	592,300	4	82,462	57,600
1941 " 1945 "	5,955	42,077,096	59,917,100	47	569,236	374,600	1	13,478	13,400
First 6 months 1946	144	901,526	1,267,200	4	36,840	34,500			
ENGINES—Total	12,445	71,000,408	99,219,900	936	6,279,393	4,678,400	52	501,076	407,200
Reciprocating	7,957	38,410,244	56,284,200	514	2,078,064	1,875,700	24	147,561	132,000
Turbine	1,708	13,819,021	16,413,000	180	2,279,043	1,351,600	11	125,759	113,000
Diesel Electric	16	85,781	118,500	2	24,821	28,600			
Diesel	2,208	12,918,571	17,635,200	218	1,545,953	1,232,000	11	185,916	135,400
Turbo-Electric	556	5,766,791	8,769,000	22	351,512	190,500	6	41,840	26,800
BOILERS (KIND OF FUEL)—Total	12,445	71,000,408	99,219,900	936	6,279,393	4,678,400	52	501,076	407,200
Motors	2,224	13,004,352	17,753,700	220	1,570,774	1,260,600	11	185,916	135,400
Coal	4,051	13,579,375	19,945,800	381	1,391,913	1,313,400	16	95,919	93,100
Oil	6,170	44,416,681	61,520,400	335	3,316,706	2,104,400	25	219,241	178,700

World as of June 30, 1946

Vessels of 1000 Gross Tons and Over. Arranged by Size, Speed, Draft, Age and Propulsion

CHANNEL VESSELS, ICEBREAKERS, CABLE SHIPS, ETC., AND VESSELS OWNED BY THE ARMED FORCES)

VESSEL TYPE											
FREIGHTERS			REFRIGERATED VESSELS			BULK CARRIERS			TANKERS (Includes Whaling Tankers)		
No.	Gross Tons	DWT Tons	No.	Gross Tons	DWT Tons	No.	Gross Tons	DWT Tons	No.	Gross Tons	DWT Tons
8,694	46,152,940	66,767,000	224	1,361,196	1,527,900	558	1,639,508	2,604,800	1,981	15,066,295	23,234,600
1,421	2,117,454	3,240,800	12	19,273	27,100	238	368,192	548,000	129	174,541	237,800
1,541	4,624,500	7,097,100	74	243,941	267,000	183	484,400	744,700	199	597,396	809,300
1,176	5,949,211	9,562,600	31	156,281	155,800	91	447,400	737,600	158	822,181	1,218,300
4,228	30,334,378	43,532,700	34	235,266	280,000	34	224,966	358,400	424	2,952,107	4,506,200
242	2,090,677	2,544,000	45	402,177	464,600	9	78,870	171,100	429	3,759,620	5,686,900
85	1,020,817	773,000	28	304,258	333,400	2	20,380	22,300	640	6,722,234	10,725,300
1	15,903	15,800				1	15,300	22,700	1	16,370	21,800
									1	21,846	29,000
8,694	46,152,940	66,767,000	224	1,361,196	1,527,900	558	1,639,508	2,604,800	1,981	15,066,295	23,234,600
458	546,564	736,400	3	8,964	4,600	59	69,095	96,900	86	103,207	133,200
2,519	6,906,095	9,459,100	104	356,281	379,900	349	736,105	1,110,900	253	722,823	968,500
697	3,649,346	4,876,800	25	167,803	170,200	54	230,551	382,300	76	381,360	546,300
1,160	6,770,505	10,332,400	33	258,211	295,300	51	271,348	448,300	185	1,125,974	1,676,500
3,820	27,858,193	40,813,800	51	478,791	568,300	37	255,586	397,800	532	4,063,839	6,100,300
36	374,009	486,400	8	91,146	109,600	2	19,376	28,600	160	1,461,349	2,260,800
4	48,228	62,100							635	6,545,793	10,487,300
						6	57,447	140,000	54	661,950	1,061,700
8,694	46,152,940	66,767,000	224	1,361,196	1,527,900	558	1,639,508	2,604,800	1,981	15,066,295	23,234,600
1,380	3,192,290	5,034,200	5	18,433	23,700	215	462,304	719,300	192	607,285	868,200
5,587	30,914,442	46,311,500	58	223,712	275,400	325	1,061,637	1,674,800	1,074	7,269,727	10,909,300
514	2,708,672	3,856,400	54	344,595	412,100	15	89,892	138,700	631	6,340,851	10,119,200
1,196	9,213,951	11,412,400	101	732,012	777,700	3	25,675	72,000	77	768,536	1,209,500
17	123,585	152,500	6	42,444	39,000				7	79,896	128,400
8,694	46,152,940	66,767,000	224	1,361,196	1,527,900	558	1,639,508	2,604,800	1,981	15,066,295	23,234,600
1,073	2,957,977	4,533,400	21	115,839	130,400	103	266,428	399,100	90	448,001	656,500
990	3,643,171	5,701,400	31	198,178	248,600	91	254,940	396,400	221	1,224,932	1,892,600
593	2,082,703	3,252,200	11	67,535	80,100	136	353,939	567,900	160	942,729	1,429,100
428	1,674,323	2,618,700	23	137,600	151,600	80	253,888	420,400	217	1,361,942	2,061,000
146	485,629	756,000	29	146,232	158,300	15	36,685	57,200	118	864,501	1,292,000
526	2,194,555	3,413,100	36	202,167	221,000	36	94,909	144,500	236	1,852,068	2,791,000
4,836	32,508,604	45,647,900	69	459,609	502,100	86	341,074	541,100	916	8,185,095	12,838,000
102	605,978	844,300	4	34,036	35,800	11	37,645	78,200	23	187,021	274,400
8,694	46,152,940	66,767,000	224	1,361,196	1,527,900	558	1,639,508	2,604,800	1,981	15,066,295	23,234,600
6,237	30,933,185	46,490,900	73	399,471	455,000	507	1,403,209	2,191,900	602	3,448,754	5,138,700
1,303	9,650,082	12,214,500	35	264,924	305,900	14	81,405	170,700	165	1,417,808	2,257,300
4	19,057	26,200	1	3,682	3,200	1	1,694	2,800	8	36,527	57,700
1,133	5,437,444	7,943,700	111	673,362	746,500	36	153,200	239,400	699	4,922,696	7,338,200
17	113,172	91,700	4	19,757	17,300				507	5,240,510	8,442,700
8,694	46,152,940	66,767,000	224	1,361,196	1,527,900	558	1,639,508	2,604,800	1,981	15,066,295	23,234,600
1,137	5,456,501	7,969,900	112	677,044	749,700	37	154,894	242,200	707	4,959,223	7,395,900
3,149	10,678,204	16,418,700	33	209,442	256,600	456	1,129,298	1,757,600	16	74,599	106,400
4,408	30,018,235	42,378,400	79	474,710	521,600	65	355,316	605,000	1,258	10,032,473	15,732,300

All-Aluminum Ships Proposed By Alcoa

CONSTRUCTION OF TWO ALL-ALUMINUM MERCHANT VESSELS—long a favorite development project of Aluminum Company of America—may become a maritime reality before many months. The proposed ships, aluminized from truck to keel, are scheduled for Caribbean runs by the Alcoa Steamship Company, an Aluminum Company subsidiary.

If construction is decided upon by the company, the merchantmen will be used to transport bauxite from Alcoa's Moengo and Paranam mines in Dutch Guiana to Trinidad, British West Indies, where the ore will be transferred to deep-draft carriers and brought to American ports.

Marking a high point in the use of aluminum for maritime use, and climaxing many years of intensive research and development work, the ships will feature hulls and strengthening members fabricated solely from aluminum alloys.

General characteristics of the first vessel are 422 feet long overall; 60 foot extreme beam; 10,232 tons displacement; cargo-carrying capacity 8,143 tons; maximum draft, 20 feet. Somewhat smaller, the second carrier will displace 6,730 tons, have an overall length of 348 feet, a beam of 54 feet and a 19 foot draft. Her cargo-carrying capacity is rated at 5,101 tons. Use of aluminum alloys will permit the new vessels to carry some 20 per cent more cargo.

Although the metal has long been used extensively in ship's superstructures. topside equipment and related installations, this will mark an important "first" in hull construction. Moreover, the light, corrosion-resistant metal will be employed in superstructures, funnels, lifeboats and davits. Bulkheads, hatch covers and miscellaneous fittings will also be formed from aluminum, as will the furnishings in all living quarters.

Use of aluminum alloys wherever practicable in the construction of these ships will result in a appreciable saving in deadweight over the conventional steel counterparts without sacrificing any of the strength so important to marine construction.

Since weight saving is so vital a factor in shipping, use of this modern marine metal will enable additional aluminum ore to be transported more economically. The all-aluminum ships may well point the way to more profitable operation through lower freight rates. It is expected, too, that operating costs will be materially reduced by the saving in maintenance that will result from this use of aluminum.

Possessing excellent resistence to salt-water corrosion, the aluminum alloy hulls and superstructures will not deteriorate in service, and long range tests conducted by Alcoa on smaller experimental aluminum hulls have well demonstrated the metal's adaptability to standard shipbuilding practices. One of the ships will be employed to transport bauxite from the Paranam mines, and the other will carry a similar cargo from Alcoa's Moengo mines.

Although the primary purpose of the all-aluminum carriers will be to move the ore of aluminum to Trinidad, they will be fitted with accommodations for twelve passengers, and in keeping with the modern all-aluminum alloy construction of the ships, quarters will be completely air conditioned.

Climaxing years of intensive Alcoa research, the 10,000 ton all-aluminum ship shown above represents a new era in marine construction. Hull, superstructure, lifeboats and fittings will be fabricated from aluminum alloys pretested for resistance to salt water corrosion. Overall length of the carrier is 422 feet, extreme beam 60 feet.

Aerial photograph of the expansive Long Beach Harbor, better known as the Port of Long Beach, California.

Port of Long Beach from the Air

IN THE IMMEDIATE FOREGROUND is the U. S. Navy Shipyard and graving docks, along the waterfront, with ships of our Navy at anchor within the protection of the mole which forms the western and seaward side of the Port of Long Beach, California. The remaining part of the Harbor, within the opposite mole and back inland bordering the channels shown, is the Port of Long Beach proper. Beyond and to the right (east) is the city of Long Beach, with the hills and mountains serving as a backdrop to the engaging panorama.

Unique in Port development are the two large moles, constructed as a result of scientific study at Vicksburg, Mississippi, from scaled models used with activated water for study of currents and wave action similar to actual conditions existant in the Long Beach Harbor Area.

The length, width and angles of the moles are such that the surge within the entire harbor and its channels has been reduced to nearly zero, making for quiet waters at all times, including storm periods.

With 35 to 45 feet deep channels throughout, and with still water constantly, an added asset has been attained in the ease and speed of handling any size ship through the harbor and at the docks. Coupled with the fact that ships are but from 6 to 15 minutes from open sea, reduces the time of dockage of ships, handling of their cargoes, a major consideration to every shipper.

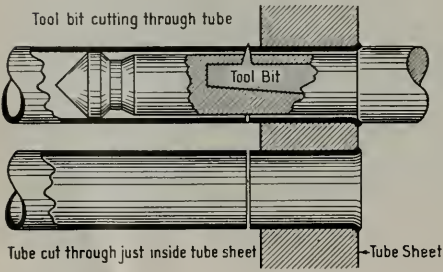
The Board of Harbor Commissioners from plans of their Port Manager and Chief Engineer have a program underway which will involve the ultimate expenditure of 59 million dollars. It is anticipated that this entire amount will be derived from Harbor revenues and from oil wells located on Port lands which are being produced and operated by the Port of Long Beach, California. This eliminates the necessity of Bond issues or increased taxation for the completion of this huge program. The Port has already received sufficient income from oil revenues to retire all outstanding Harbor bonds, and is now one of the few, if not the only, debt-free Ports in the World.

Condenser Repairing Equipment

When CONDENSER MANUFACTURERS adopted the practice of rolling one or both ends of tubes in tube sheets, a new problem was created for the repair yard, namely, a quick method of removal. To insure tight joints that would remain tight in spite of expansion and vibration, serrations were grooved into the tube sheets, thereby causing additional difficulties.

The ingenuity of machinery superintendents, port engineers, and others was challenged and many time and labor saving tools were developed to reduce the time required for this difficult and unpleasant work. A variety of fly cutters, drifts and drills were employed but in almost all cases it was necessary to lower men into the condenser and break the joint made by rolling from behind the sheet or to remove the sheet from the condenser, cut the tubes and drive out the nipples.

A complete set of pneumatically operated tools have been developed by Armstrong & Sons Company, Ridgefield, New Jersey, for removing old and defective tubes from condensers and heat exchangers. This set consists of two separate tools, the first being a rotary tube cutter used when tubes are rolled at both ends or when the packing is particularly tenacious and an attempt to pull them might cause them to break or stretch. After it has been determined from the location of surrounding pumps, generators, piping, etc., from which end of the condenser sufficient space is available for tube removal, the tubes are cut on the opposite end just inside the tube sheet. The diagram below shows the cutter with tool bit engaged in cutting position. The spindle carrying the cutter is rotated by an air motor. An adjustable shoulder determines the distance behind the sheet that the cut is to be made and when the tool is in cutting position, the tool bit which has been held in its retracted position, is caused to engage the tube by means of a small lever and a quick clean cut through the tube wall is made. This operation requires only a few seconds and an operator can easily cut as many as 15 tubes per minute.



The cutter is adaptable for 16 or 18 gage tubes from ⅝″ to 1″ inclusive. It can be operated by one man by suspending it from a pulley by means of a rope and counter-balancing it.

The second tool is a tube puller for removing the short and long section formed by the above cut. This patented, simple, compact machine is adaptable to any condition, whether the tubes are rolled at one or both ends, or packed with fibre, corset lace, or metallic packing. Engagement of the tube puller with the tube and packing is rapid and automatic.

The machine consists of a cylinder with two pistons whose rods and attached mechanisms extend to the front of the piston. By moving the pistons, the teeth grip the tube and remove it from the sheet. Any size non-ferrous tube from ⅝″ to 1″ inclusive can be pulled. The tube is pulled 8″ from the sheet, from which point it can be gripped by hand and slid the remaining distance until removed from the condenser.

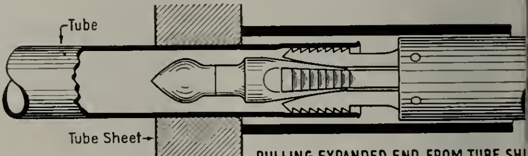
The complete operation of the puller is effected by throwing a three-way valve in one direction to pull the tube, and in the opposite direction to release its grip, so that it can be removed and inserted in the next tube. It requires two operators for most efficient use and under favorable conditions, 15 to 20 tubes per minute can be loosened.

On a recent job which required removal of tubes from a defective tube sheet, 6150 tubes were cut at one end, pulled 6″ out of the tube sheet at the other end and the short tube ends completely removed in 24 hours.

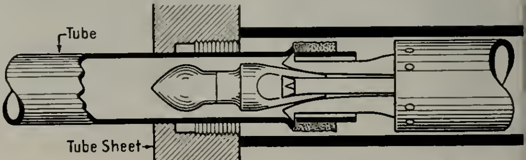
The following diagrams show the head of the puller engaged in pulling both a rolled tube and a packed tube.

Due to the intricate nature of the tools and the high costs of manufacture most prospective users prefer to engage the equipment with supervision of operation. In this way, repairs can be handled with great savings in time and cost.

The equipment is represented on the Pacific Coast by Harang Engineering Company, 840 Lake Street, San Francisco, California. Demonstrations are cheerfully made for interested users or professional groups.



PULLING EXPANDED END FROM TUBE SHI



PULLING TUBE WITH PACKING

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

MEMBERS OF A GROUP OF 25 SAN FRANCISCO BUSINESS LEADERS AND THEIR WIVES, WHICH LEFT MARCH I ON THE FIRST POSTWAR VISIT BY AIR TO THE HAWAIIAN ISLANDS, SPONSORED BY THE SAN FRANCISCO CHAMBER OF COMMERCE.

Nine days were spent in the Islands making individual business development calls and consulting with civic leaders on inter-related community problems. Efforts were directed toward strengthening relations between the mainland and the Islands.

Bottom row, left to right: Naaman T. Meyers; Thomas A. Leddy, manager, San Francisco Division, Zellerbach Paper Company; Fred Galbreath, manager, Marine Office of America; Alvin C. Eichholz, manager, World Trade Department, San Francisco C. of C.; George O. Bahrs, president, San Francisco Employers Council; Mrs. Fred Galbreath; Mrs. C. C. Chinn; C. C. Chinn, manager, D. E. Sanford Company, distributors; Ronald E. Kaehler, president, San Francisco Stock Exchange; Robert Feldhammer, exec. secretary, Manufacturers & Wholesalers Association, Apparel Trades Industry.

Top to bottom, left: E. J. McClanahan, vice pres., Standard Oil Company of California; Mrs. Louis B. Lundborg; Charles C. Bowen, Charles C. Bowen & Company, Management Consultants; Mrs. Carl J. Eastman; Carl J. Eastman, vice pres., N. W. Ayer & Son, Inc., and pres., San Francisco Chamber of Commerce; L. Deming Tilton, Planning Consultants.

Right: Bradford Lundborg; Louis B. Lundborg, mgr., San Francisco Chamber of Commerce; Donald L. Ross, Special Representative, Standard Oil Company of California; Mrs. Donald L. Ross; Mrs. Benjamin Swig; L. N. Thompson, manager, Egg Department, Poultry Producers Association.

U. S. Replaces Germany In Turkish Market

The rich Turkish market that was predominantly Germany's before the war, is now America's for the taking.

That is the view of Robert Liebert, distributor in Turkey for the products of Borg-Warner International Corp. He is in Chicago on his first postwar trip to this country.

Only a failure on the part of American manufacturers to "make good" on deliveries could prevent our capturing the 75 per cent of Turkey's import business which used to go to German traders, Mr. Liebert said.

He names four factors favoring increasing Turkish trade with the United States: (1) A strong consumer demand in Turkey for "the best" in quality, frequently regardless of price; (2) a wide-spread desire to increase Turkey's standard of living; (3) the new popularity of everything American"—from Americans themselves to their movies and their shiny manufactured products; and (4) the knowledge that the U. S. has no imperialistic designs upon Turkey.

Unfavorable factors: (1) Britain, Belgium, Switzerland, Sweden, Czechoslovakia—and even Italy—have intensified their export activities in recent months; (2) while the average prices of their manufactured goods are below America's, they have not yet matched American products in efficiency and economy of operation.

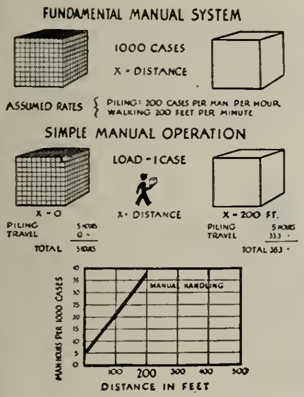
With Turkish currency devalued about a month ago and 40 per cent less American dollars now needed for purchases there, Turkey is hopeful of increasing its export of tobacco and dried fruits to the U. S.

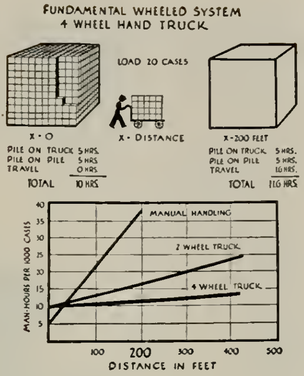
Dr. V. K. Wellington Koo, Chinese Ambassador to the United States, with Arthur B. Foye (left), President, China-America Council of Commerce and Industry, and C. S. Ching (right), Chairman of the Council's Board of Directors,' at conference on Sino-American economic relations, Waldorf-Astoria Hotel, New York, February 18th.

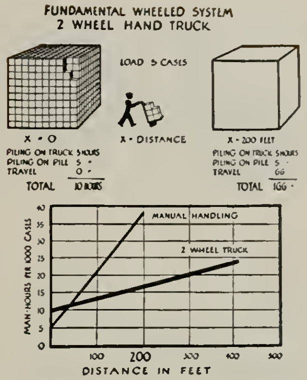
Mr. Liebert's firm distributes Borg-Warner International Corp.'s refrigeration and household appliance lines throughout Turkey. Mr. Liebert expects America to retain the dominant position in this trade which it enjoyed in Turkey even before the war, in contrast to a general trade picture that was most favorable to the Nazis.

While in the U. S. Mr. Liebert placed large commitments for Norge refrigerators and appliances. Although the Turkish automotive market is predominantly British and continental, substantial orders were placed for American equipment including Marvel-Schebler carburetors.

Participants in conference on Sino-American economic relations sponsored by the China-America Council of Commerce and Industry at the Waldorf-Astoria Hotel, New York, February 18th. At speaker's table, from left to right are: Dr. D. K. Lieu, Commercial Counselor, Chinese Embassy in U. S. A.; Dr. P. W. Kuo, Deputy Director General of UNRRA; Blackwell Smith, Chairman of the Executive Committee of the China-America Council; Loy Chang, Special Representative in the U. S. A. of the Chinese Ministry of Finance; William P. Hunt, member of the Council's Executive Committee, and Dr. S. P. Ladas, Chairman of the Legislative Committee of the Council.







Time and Motion Analysis For Materials Handling

In a recent issue of "Exide Topics" published by the Electric Storage Battery Co., H. A. Stevenson of the Electric Industrial Truck Assn. Pallet Committee presents a well prepared analysis of materials handling. All drawings herein are by courtesy of Exide Topics.

There is no short cut substitute for analysis of materials handling jobs. There is no better recommendation than to pick out from general observation the heavy volume, time-and-space-consuming jobs and then analyze those jobs with a questioning attitude. You should determine:

What is being done. Why it is being done. Where it is being done. How it is being done.

Then, without too much regard for precedent in your warehouse, apply certain well-established principles of material handling and know-how to determine:

Where it should be done. How it should be done. By what it should be done.

If you or your staff are not qualified or lack the time to do that, have a qualified group do it for you. You will save money in the long run.

The two illustrations covering small and large business may not fit your conditions. What are your conditions? Which handling method and what types of equipment will meet them? General Levin Campbell is credited with saying, "If you want to eat an elephant, you must cut it up in small pieces." Material handling, cut in small pieces, consists of moving a pile of packages of given size and weight and the transportation of those packages from one location to another. These operations may be repeated many times and with many variations, but material handling essentially involves only these two operations: (1) piling, (2) transportation. The simplest form of material handling is that where a man picks up a package, walks a certain distance and puts it on another pile. Let us consider a pile of 1000 packages to be moved a certain distance and repiled. Before attacking this very simple problem, we have two forms of data.

1. How many packages can a man pile per hour?
2. How fast will he walk between the two piles?

Let us assume that a man in the plant will pile 200 packages per hour, and that he walks at a speed of 200 feet per minute under this plant's conditions. These figures, while they represent actual conditions which have been observed, may vary widely in different plants, and intentionally, the size and weight of the packages are not given in these fundamental assumptions.

Now let's assume a movement that involves our funlamental assumptions.

To move 1000 of these packages 200 feet and pile, using the data above, 5 hours are spent piling, and 33 3/10 hours in transportation between piles. This, of course, includes the return trip. If a man simply repiles a thousand cases at the same location, or travels zero distance, the operation will require 5 hours. If, in addi-

tion, he moves the pile 200 feet, he will utilize in the entire operation 33-3/10 hours. These two points, zero distance and 200 feet project a curve from which we can read the man-hours required to move the pile any required distance by this method.

Suppose we give our man a 2-wheel truck capable of carrying 5 cases per trip. In this case, he piles twice—once on the truck and once on the final pile. Thus, the piling time is doubled, but the travel time is divided by 5. Inasmuch as 10 hours are spent piling, our curve starts at 10 man-hours for zero distance. Inasmuch as only 1/5 the time is required for travel, we have 6-6/10 hours of travel or a total of 16-6/10 man-hours to move the pile 200 feet. Again a line through these two points projects a curve of the man-hours required for any distance the pile is moved by this method. An interesting point is that the portion of the original line which is below the new line indicates a distance within which the most primitive form of handling is more economical than the use of the 2-wheel truck.

If we increase the unit load for the travel by providing our man with a 4-wheel truck capable of carrying 20 cases, we have the same piling time as with the 2-wheel truck, but our travel time is ¼ of that with the 2-wheel truck and we find a total for 200 feet of travel to be 11-6/10 man-hours. Again, striking a line, we find at every distance there are less man hours, or that this method is more economical than the 2-wheel truck for this particular set of conditions. We do find, however, that even in this case there is a certain distance at which the most primitive method is still more economical than the 4-wheel truck.

Naturally, the travel in each of these cases could be accomplished by conveyors, and under certain conditions where an operation requiring the individual handling of each package is encountered, the conveyor is one of the most useful tools we have. In this case, we require 5 hours to pile the material on the conveyor and 5 hours to pile it from the conveyor in a new location. Transportation man-hours being zero, we have a horizontal line starting at 10 man-hours for our 1000 pieces and remaining at that figure regardless of the distance the material must be moved. This shows a man-hour economy greater than the 2-wheel truck or the 4-wheel truck to all distances, but still the primitive method on the extremely short distance is more economical.

Now we come to the pallet and fork truck method in which we make our pile at the source our first operation and move a whole section of the pile successively to a new location, eliminating the necessity for repeated handling of the individual packages. In this case, we have one piling operation involving 5 hours' piling on pallets. The travel time is greatly reduced inasmuch as one man with a fork truck can handle two or more times as many cases per trip and operates about twice as fast. In this case, we have a line starting at 5 hours per thousand and increasing gradually with the distance due to the rela-

(Please turn to page 127)

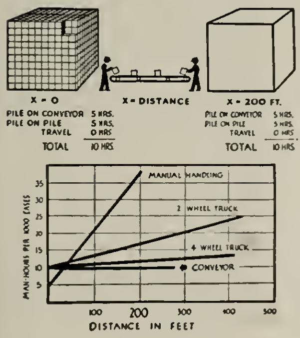
CHART NO. 9

COMPARATIVE COST OF HANDLING 1000 PIECES - 200 FT.

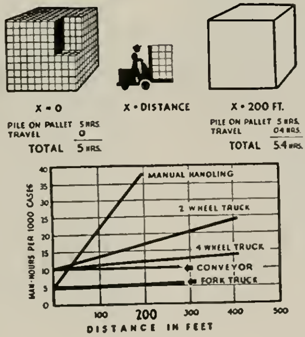
ASSUMPTIONS:
LABOR COST $1.00 PER HR.
COST OF OWNING AND OPERATING A BATTERY-POWERED ELECTRIC TRUCK:
2000 HRS. PER YEAR — $0.49 PER HR.
4000 HRS. PER YEAR — 0.32 PER HR.
TRUCKING COST ALONE 0.4 HRS. x $0.49 PER HR = $0.196

CASE	LABOR COST	TRUCK COST	TOTAL COST PER 1000 PIECES
A (MANUAL)	$38.30		$38.30
B (2 WHEEL HAND TRUCK)	$16.60		$16.60
C (4 WHEEL HAND TRUCK)	$11.60		$11.60
D (CONVEYOR)	$10.00		$10.00
E (FORK TRUCK)	$5.40	.196	$5.59
F (PALLET FORK TRUCK SYSTEM)	.40	.196	.59

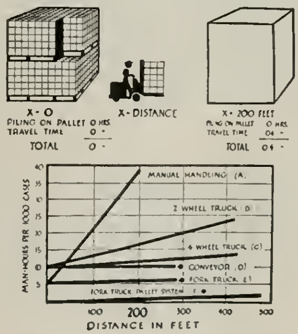
CONVEYOR SYSTEM



ELECTRIC FORK TRUCK SYSTEM



ELECTRIC FORK TRUCK HANDLING PALLETIZED INCOMING SHIPMENT



The Junior World Trade Association of San Francisco

This live organization is offering its members — and the entire world trade profession—some constructive assistance in its efforts to solve the problems of the industry. Following a recent dinner meeting presided over by John L. Stewart, president, a comprehensive address on marine insurance was given by Donald Tormey of Marsh & McLennan. Mr. Tormey conducts the course on marine insurance offered by the Association of Marine Underwriters of San Francisco.

The address was so important that many members were anxious to have it printed for more intensive study.

Additional copies of this book may be obtained through President Stewart, c/o Baxter Trading Co., or Secretary John J. Mulvehill, c/o American President Lines (Freight Department).

An Insurance Analysis for the Shipper

By Donald Tormey

MARINE INSURANCE IN FOREIGN TRADE is far too large a subject to attempt to cover at one sitting. I have, herefore, chosen to limit my discussion to certain aspects of cargo insurance.

There are certain risks that are inherent to business and which must be borne by the importer or exporter. The success of a merchant engaging in Foreign Trade will to a large extent depend on his knowledge of markets, credits, durability of goods, packaging and the inherent qualities of his merchandise.

There are risks, however, that the merchant can pass on to others. As the owner of cargo he stands at the apex of a triangle. To one side of him is the carrier and to the other side is his marine insurance underwriter. The cargo owner, of course, has the primary burden of loss. The carrier, however, by virtue of the contract of affreightment or bill of lading, and the underwriter, by virtue of the contract of insurance, assume a certain portion of his burden.

The carrier who issues a bill of lading has under common law the obligation of delivering the cargo safely at the named destination unless prevented "by acts of God or the King's enemies." This basic law has been greatly modified by statute. Further exceptions are set forth in the bill of lading.

The underwriter who issues a marine insurance policy on cargo agrees to indemnify the party at interest in case of loss or damage but only in accordance with certain terms and conditions. These terms and conditions are set forth in the policy.

If we study the risks excluded by the terms of the bill of lading and then learn whether they are covered by the insurance policy, we will have a better idea of what risks the merchant must bear himself. We must keep in mind the carrier assumes full responsibility for the cargo unless relieved in part by common law or statute; whereas, the insurance assumes only such liability as is specifically set forth in the insurance policy.

The Carriage-of-Goods-by-Sea Act of 1936 is the most important statute affecting the carrier's obligations under the bill of lading. Passed by the Congress of the United States in 1936, it provides that every outward bill of lading shall contain a statement that it is issued pursuant to the provisions of the Act. It also provides that every incoming bill of lading shall be subject to the

Act. The provisions of the Act, however, are not necessarily set forth in the bill of lading. To understand the carrier's obligations, as modified by the Act, it is necessary to review its provisions.

Our review of the Carriage-of-Goods-by-Sea Act will be limited to the way in which it relieves the carrier from his basic obligation to deliver the cargo at the named destination in the same condition as he receives it. While we are doing this, we will note whether the marine insurance assumes the responsibilities from which the carrier is excused. We are assuming for the purposes of this discussion that the marine insurance policy is the usual policy issued on "With Average" conditions and subject to the usual Strikes, War and Marine Extension endorsements.

Fundamentally, the carrier is expected to furnish a seaworthy vessel but he is not liable for loss or damage due to unseaworthiness unless such loss or damage is caused by want of due diligence on the part of the carrier to make the ship seaworthy. The question of unseaworthiness does not arise under the insurance because between the assured and the insurance company the seaworthiness of the vessel is admitted. Thus, the carrier who can show due diligence would not be liable for loss due to unseaworthiness. If the loss, however, was due to one of the perils covered by the insurance, the unseaworthiness of the vessel would not be a bar to recovery.

The carrier is not responsible for loss or damage arising from "Act, neglect or default of the master, mariner, pilot or the servants of the carrier in the navigation or in the management of the ship." The insurance picks up this liability generally using the exact wording of the Act or by reference to the Act in doing so.

The carrier is not responsible for fire losses unless caused by the actual fault or privity of the carrier. The insurance policy assumes the risk of fire unless due to the inherent quality of the goods, i. e., spontaneous combustion in fishmeal.

The carrier is not responsible for loss from "perils, dangers and accidents of the sea or other navigable waters and 'Acts of God.'" "Perils of the sea" and "other like perils" are specifically stated as being risks the insurance undertakes to bear.

The Act relieves the carrier from responsibility for "Acts of war, acts of public enemies and arrests or restraint of princes, rulers or people, or seizure under legal process." The war risks endorsement provides insurance against these risks, except for "seizure under legal process." Space does not permit a full discussion of the limitations of the war risk insurance. The carrier is relieved in full for loss due to act of war but the war risk insurance does not assume liability in full for the same risks. There are certain war risks that it would be contrary to the public policy to insure and some underwriters are unwilling to assume.

Quarantine restrictions constitute another peril. The carrier is not responsible for loss or damage due to such restrictions. Marine insurance does not provide protection against losses due to such restrictions. It is the responsibility of the cargo owner to know that his merchandise meets the requirements of the country it is entering.


Donald Tormey

The carrier is also relieved of liability for loss due to the acts or omissions of the shipper and insufficiency of packing and marks. The insurance does not assume liability for losses due to these causes. They are not listed as perils which the underwriters are willing to bear. It, therefore, behooves the cargo owner to see to it that the usual obligations of a shipper are fulfilled and that the goods are properly packed and marked for the intended voyage.

Strikes (but not the carrier's own acts) as well as riots and civil commotion relieve the carrier of his obligation to deliver the cargo safely at the named destination. The S. R. & C. C. endorsement on the policy provides protection against these risks.

We come now to "Inherent vice." The carrier is not liable for loss or damage due to inherent vice nor is the insurance company. This is certainly a risk that the owner of the cargo must bear himself. "Inherent vice" may be more easily understood if described as those qualities of a commodity that make that particular commodity subject to changes that lower its commercial value. For example: Iron will rust with the mere passing of time.

Therefore, the carrier would not be liable for loss due to the rusting, nor would the insurance company.

Summarizing the discussion so far, we can say that the cargo owner cannot look to the carrier for recovery of losses caused by:

1. Perils of the sea.
2. Acts of God.
3. Public enemies.
4. Inherent vice.
5. Faults or neglect of shipper.
6. Faults or errors in the navigation or management of the vessel.
7. Fire.

These cover practically all major perils—stranding, sinking, burning, collision, heavy weather, war. They do not, however, include negligence of carrier in loading, stowage, custody and care of cargo.

We have also noted that the insurance covers causes of loss for which the carrier is not liable, except:

1. Inherent vice.
2. Fault or neglect of the shipper.
   a. Insufficient packing.
   b. Insufficient marking.
3. Delay, deterioration due to delay.
4. Frustration of voyage.
   a. Due to war.
   b. Due to strike.
   c. Due to weather.
   d. Due to other causes beyond the control of shipowner.

So far, we have been discussing the perils, the intervention of which will excuse the carrier from the obligation of delivering the cargo safely at the named destination. The Carriage-of-Goods-by-Sea Act also limits the carrier's liability in certain other ways. It must be borne in mind that these limitations are separate and aside from the question of liability, on the part of the carrier.

The carrier is not liable for more than $500 per package or customary freight unit unless he accepts a higher valuation. The insurance policy has no such limitation. In no event is the carrier liable for more than actual damage based on sound market value at destination. The insurance is based on an agreed valuation. In event of total loss, *the insured value will be paid* and in the event of partial loss, *the damaged value will be compared to the sound market value* to determine a fraction, which fractional part of the insured value will be paid.

While the bill of lading requires that notice of apparent damage must be given the carrier before removal of the cargo, failure to give such notice does not prejudice right to payment of claim under the insurance. The same thing is true of written claims, the bill of lading requiring, in most instances, that written claims be filed within thirty days. The cargo owner can recover from the insurance company without having filed a written claim against the carrier.

Lawsuits to recover losses believed to be payable by the shipowner must be filed within one year after delivery of the cargo or the time the cargo should have been delivered. The assured under a policy does not have to comply with this requirement. We should keep in mind, however, that failure to comply with the requirements of the bill of lading in regard to notice, claims and suits does prejudice the insurance company rights of subrogation. Since a good many claims payable under the insurance are also collectible from the carrier, an assured should cooperate with his underwriter in the collection of such claims or expect to see his insurance costs go up.

The Limitation Statute which is preserved by the Carriage-of-Goods-by-Sea Act limits the carrier's liability in regard to cargo to the value of the vessel and pending freight. In some instances, this amount may not be sufficient to pay the total damages to cargo. The insurance policy, if specifically arranged, has no such limitation. If the insurance is provided by means of a certificate issued under an open policy, the limitation per vessel expressed in the open policy must be considered.

When a collision happens at sea, the liabilities of the parties involved may appear to be very complicated. Most collisions are due to negligence. Since the Carriage-of-Goods-by-Sea Act relieves the carrier of liability for negligence of master, mariner, pilot or servants of the carrier in the navigation of the vessel, it seldom happens that the carrier is liable for damage to cargo on the vessel due to collision. If the other or non-carrying vessel is held "to blame," cargo on the carrying vessel can collect from the non-carrying vessel. Under the insurance policy, the cargo owner is protected regardless of who is "to blame" for the collision. In the case of a "both-to-blame" collision, the cargo owner can only collect one-half of his loss from the carriers involved, but he can collect his full loss, up to the amount of his insurance, from the insurance company.

General Average

The expression "General Average" is very confusing to anyone not familiar with Marine Insurance. In order to understand the expression, it is first necessary to know the meaning of the word "Average" in reference to Marine Insurance. Actually, it is an unintelligible symbol. We might just as well use any other combination of letters, but since we do use this particular combination, it is interesting to speculate on why we do.

Students of the subject have not been able to definitely trace the origin of the word. They have developed several theories. One is that it comes from the old Eng-

(Please turn to page 126)

Pacific
WORLD
TRADE

Marine Insurance

Our London Letter

By Our U. K. Correspondent

TWO OF THE LEADING UNDERWRITING ASSOCIATIONS in the country have issued their annual reports. They are the Institute of London Underwriters and the Liverpool Underwriters' Association.

Institute of London Underwriters

At the annual meeting of the Institute of London Underwriters, Harold H. Mummery said that the period which he was reviewing was the first complete year of peace ("if one may call it so") since 1938. We had heard in the past year a great deal about reverting to freedom of underwriting.

Mr. Mummery continued:

> "I understand quite well that there must be many of the younger generation of underwriters who are anxious to win their spurs. I would, however, add this word of caution—that underwriting under conditions such as exist today must necessarily differ in its entirety from similar conditions as they existed during the period of the war.
>
> "We must get back to exercising our own individuality, but if at any time we see a risk which cuts across an agreement to which we have subscribed, then whatever our neighbour may have done, that risk should not be written.
>
> "For these reasons, I do feel most strongly that if we are to maintain this great market as the marine insurance center of the world, it is of paramount importance that we should be unselfish and effect the transfer from war to peace conditions in a thoughtful and unhurried manner, and so make certain that we establish a sound foundation.
>
> "In other words, each one of us must be prepared to sacrifice premium at times in order to achieve something worth-while. I am convinced that never was it more necessary to seek collaboration, not only amongst ourselves but with the various sections of the market, and what is perhaps still more important, between the various markets of the world."

This led Mr. Mummery to think of the International Union of Marine Insurance, which he described as the forum in which can be debated the many problems "with which we and our friends are likely to be confronted now and in the future." He quoted from the "Liverpool Journal of Commerce" of the 16th October, 1946, the following:

> "Moreover, I am able to state that steps are being taken which may enable not only Lloyd's underwriters to become full members of the Union, but would also overcome the difficulties which American underwriters experience in adhering to the Union by reason of their anti-trust laws."

Mr. Mummery was sure he was speaking for each of those present at the meeting of the Institute of London Underwriters when he expressed the hope that this may be so.

Another important point in Mr. Mummery's lengthy review, in connection with theft and pilferage, was that shipowners and port authorities could do more to save cargo from the depredation of those having access to the docks. Mr. Mummery commented:

> "Personally—and it must be understood that I am merely expressing an individual view—I would like to see underwriters giving consideration to the setting up of an organisation which could be called upon to supervise and examine the loading and discharge of cargoes, not overlooking any supervision which might be necessary at a port or place of transhipment. This practice is, I think it true to say, followed to a great extent by our colleagues across the Atlantic, and I think such an organisation would, over a period, more than justify itself."

The annual report of the Liverpool Underwriters' Association also deals with theft and pilferage of cargo. The number of claims resulting from this evil have increased during the year to "an alarming extent, and represent a serious problem at home and overseas." The Committee feel that the problem is one of national importance, as the high proportion of losses through theft and pilferage of commodities which are in short supply is a matter which affects the general public, and they trust that the authorities will view the situation with the gravity which it warrants by doing everything possible to increase the number of police and trustworthy watchmen on the docks and by imposing terms of imprisonment on offenders. It is hoped, too, that attempts will be made to improve the quality of packages.

LIVERPOOL UNDERWRITERS' ASSOCIATION

At the annual meeting of the Liverpool Underwriters' Association, Oscar Prentice, the chairman, said:

> "I must give a word of warning to English underwriters with regard to U. S. A. hulls. That market knows its business much better than we do, and it is of no value to English underwriters, or to the country in the form of invisible exports, to make material undercuts in their rates. U. S. A. business written at

a loss is a further drain on our already precarious dollar position.

"We must bear in mind that the discounts on U. S. A. hulls are 2½ per cent. less than ours, and that, in addition, we have to pay a stamp tax of 4 per cent. Underwriters are, in my opinion, batting on a very poor wicket."

A COMMENT ON AMERICAN INSURANCE MARKET

Insurance people in London have noted with interest an article (in "The Eastern Underwriter") by W. Irving Plitt, vice president of the Atlantic Mutual Insurance Company. Mr. Plitt's picture is regarded as a black one. He admits that the picture is gloomy, but points out that marine underwriters thrive on problems. "Frankly," writes a London marine insurance commentator, "I do not like his final remarks to the effect that there are some bright spots, such as the tremendous increase in the foreign trade of the United States and the prospect of 'a great American merchant marine and the hope for a more nationalistic spirit in the American people so that our American insurance market may truly become a world market of the first magnitude.'"

The commentator adds:

> "I would suggest that to aspire to become a world market of the first magnitude is right and proper, but to hope to do so by nationalism is contrary to the spirit of the Atlantic Charter, especially where marine insurance is concerned, for marine insurance is an international, not a national, business, and depends for its continued prosperity upon the absence of nationalistic restrictions."

RELATING TO SEIZED SHIPS

News of an important lawsuit, of particular interest to shipping, comes from Copenhagen. The case will shortly come before the Danish Court of Justice. A number of Norwegian shipowners are jointly suing three Danish shipyards, the Ministry of Finance and the Danish War Insurance Office for the payment of 34,000,000 kr. in respect of Norwegian vessels building in Denmark at the time of the German invasion in 1940, and eventually seized by the Germans. The question is about eight diesel vessels ordered from Danish builders in 1938 and 1939, and the construction of which was in progress when the Germans came, six vessels building with Messrs. Burmeister and Wain, Copenhagen, two with the Nakskov Shipyard, Nagskov, and two with the Odense Steel Shipyard, Odense. The seizure of the ships by the enemy took place in the spring of 1941, and the said builders were forced to complete the vessels.

It is held by the Norwegian owners that the three Danish shipyards committted a breach of contract in conforming to the orders of the Germans. The seizure was contrary to the rules of the Hague Convention, and the shipyards were not entitled to allow the Germans on board the vessels, or to proceed with their construction for German account. Furthermore, it is held that the circumstance that the builders, at the time of the seizure, sought and obtained guarantee from the Ministry of Finance as a security against forthcoming compensation claims from the Norwegian side, is, it is contended, a proof of builders realising that it was contrary to international law to obey the German orders. That when, also, the Danish State is made responsible for the losses sustained by the Norwegian shipowners, the reason is, it is alleged, that the Danish State neglected its duty to protect the property of foreign citizens on Danish territory. The lawsuit concerns the following vessels (with claim amounts attached): m. s. "Kurland" (8,075,500 kr.), m. v. "Lappland" (5,816,113 kr.), m. v. "Austanger" (500,080 kr.), m. v. "Johan Essberger" (2,851,667 kr.), m. v. "Falkanger" (1,613,688 kr.), m. v. "Hopeville" (1,104,236 kr.), m. v. "Viator" (3,500,202 kr.) and m. v. "Ferngulf" (3,528,982 kr.).

A later report states that, in connection with the legal action taken by a combine of five Norwegian shipowners against three Danish shipyards, the Ministry of Finance and the Danish War Insurance, in respect of new construction in Denmark for Norwegian account, which, during the German occupation of Denmark, was seized by the enemy and eventually completed by the shipyards under German pressure, from Britain, also, a similar lawsuit has been started against the shipyard of Burmeister and Wain, Copenhagen, the Ministry, and the War Insurance. The British owners are the Blue Star Line, Ltd., London, who claim compensation of about 14,000,000 kr. in respect of the m. s. "Adelaide Star" which, in 1939, was under construction at Copenhagen, was seized by the Germans and completed under their orders. It is anticipated that only one or two of the cases will go to court, and that the outcome of them will be decisive for the other vessels.

ARGENTINE INSURANCE LAWS

It is the considered opinion in London marine insurance circles that the Argentine Government's proposed nationalist insurance laws, as originally drafted, would have proved unworkable. No surprise, therefore, has been expressed at the change of policy. It appears that the Argentine has been having some "second thoughts" regarding this matter, no doubt following the adverse comments which have been directed against it from sundry quarters. They have, of course, been giving the matter their attention since May last year.

The initial draft was never ratified by Congress. A second draft introduced into the Chamber of Deputies is not expected to be passed, and it is said that a third draft is under consideration. The aim of the Government to set up a national reinsurance institute seems to remain unchanged, and so does the intention to exclude foreign participation by shareholding in Argentine companies, but the law of last May prohibiting the insurance of imports and exports in transit by other than Argentine insurers, which was never ratified, is said to have been scrapped.

"No wonder!" is the comment. Had the insurance law been enacted, not only would it have proved unworkable, but Argentine importers and exporters would have been involved in great difficulties.

DENMARK

Insurance expenses, states a Copenhagen correspondent, have become a little cheaper, but the premiums claimed by the Danish war insurance are above the terms on which the vessels could be covered in other markets, and if the compulsory Danish war insurance continues in existence the effect of it will be that Danish owners cannot benefit from the advantages of covering insurances in the cheapest market. Compensation for vessels lost during the war outside the blockade is only partially settled by Great Britain, Canada and the United States, whereas this problem still remains unsettled with France, South Africa, Holland, India, etc. The agreement arrived at with Great Britain, on the basis of £10,000,000, plus an additional amount of between £500,000 and £1,000,000 to cover repairs to re-delivered vessels, is satisfactory; nevertheless, the compensation for the lost vessels does not cover the full hull war insurance value of the tonnage at 9th April, 1940. The balance, therefore, will have to be claimed from the Danish war insurance. The compensation negotiated with Canada and the United States is a little better. The total amount to be received from the United States lies between $26,000,000 and $30,000,000, but also on this basis there is a margin to be covered by the Danish war insurance.

FRANCE

It is reported from Paris that, according to a communication from the Central Committee to Sworn insurance Brokers, the Minister of Finance recalled in a recent circular that marine insurance operations could only be undertaken in France and her oversea possessions by firms, or organisations, having complied with certain obligations—notably as regards compulsory reinsurance —laid down in an ordinance of 23rd January, 1945. The circular added that Lloyd's, London, not falling in this category, are not legally competent, under present conditions, to carry on marine insurance in France. Any contracts entered into with Lloyd's would, therefore, constitute a breach of the ordinance of 1945.

Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

Liability for Injuries Ashore

AN INTERESTING GROUP OF CASES are being brought to trial in many jurisdictions since the decision of *Aguilar vs. Standard Oil* and *Moss vs. Alaska Packers Association* which are based upon the theory that a seaman injured during authorized shore leave is entitled to wages and maintenance for the period of disability even though the injury occurs ashore and in some cases at a great distance from the vessel. One of the exceptions to the rule lies in proof of misconduct on the part of the seaman. What factors would, in a given case amount to misconduct are difficult to spell out. In any event, a recent decision in the District Court of Pennsylvania appears to extend the aforesaid rule by permitting a seaman to recover not ony for wages and maintenance but also damages for negligence even though the injury occurred ashore.

In *Nowery vs Smith and Johnson*, 1946, the plaintiff, a seaman, brought suit for personal injuries under the Jones Act against the operators of the SS MATTHEW B. BRADY. Plaintiff's alleged injuries were sustained as a result of a fist fight with the chief engineer of the BRADY, one Nantau, while plaintiff was on shore leave in a barroom at Antilla, Cuba. The court's charge to the jury provided that they could find for the plaintiff if they found (a) that Nantau, when he entered the barroom where the fight occurred, was acting as an officer of the ship, and was on the ship's business; *or* (b) if they found that Nantau was a man of vicious and brutal tendencies, who was likely to engage in violent and unprovoked physical assaults upon his fellows, and that Nantau's disposition was known, or should have been known, to the master of the vessel; provided, in either instance, that the jury also found that plaintiff was free from willful misbehavior, and that he did not provoke the assault.

The court discusses the case of *O'Donnell vs. Great Lakes Dredge & Dock Co.*, a United States Supreme Court case, where a seaman, pursuant to orders, was standing on the dock alongside his ship repairing a conduit through which a cargo of sand was being discharged from the vessel; and, while so engaged, he was injured through the negligence of a fellow employee. In holding that the plaintiff could recover under the Jones Act, the Supreme Court said:

> "The right of recovery in the Jones Act is given to the seaman as such, and, as in the case of maintenance and cure, the admiralty jurisdiction over the suit depends not on the place where the injury is inflicted but on the *nature of the service and its*

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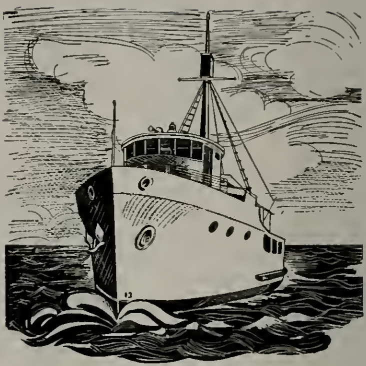
Coast COMMERCIAL CRAFT



Controllable Pitch Propellers On New River Craft

A REVOLUTIONARY STEP IN THE DESIGN and motivation of river craft has been taken with the construction of two 525 foot all steel streamlined automobile carrying vessels by the St. Louis Shipbuilding and Steel Company for Commercial Barge Lines, Inc., of Detroit, Michigan.

Designed by top ranking naval architects and marine engineers, these modern vessels are the first river craft to incorporate many commercial adaptations of propulsion principles developed and tested under battle conditions during World War II. Multiple high speed diesel engine units driving controllable pitch propellers provide power and maneuverability hitherto unknown to inland waterway cargo vessels. These propellers were originally engineered by General Motors to meet the Navy's inportant landing craft and sub-chaser requirements.

Christened the Commercial Clipper and Commercial Express, immediate use of the trim sister craft will be to make scheduled runs between automobile assembly

The Commercial Clipper operating with two of its three units during trial runs on the Mississippi. The center unit had not been completed at the time of the trials.

plants at Evansville, Indiana, and connecting highway transportation lines at Guntersville, Alabama, a distance of some 500 miles.

Each of the 525 foot vessels consists of three separate 175 foot units tightly joined by cable and ratchets. When integrated, the fine lines of the hull are carried throughout the entire length without sacrificing speed or efficiency. The bow and center units are made up for four cargo carrying levels, all of which may be loaded or unloaded from either end by the use of adjustable ramps. The stern section is the power unit, with an elevated pilothouse located on the port side. Generous crew accommodations, propulsion engines, maintenance machinery, and fuel bunkers are all located in the hull of this unit. In addition, three levels of storage area are available for cargo.

In operation, the vessels may be made up of either two or three units, depending upon load requirements. Three integrated units can accommodate 600 automobiles and 498 long tons of freight. Fully loaded, each unit displaces 2483.5 tons of fresh water to a 5½ foot draft. Beam at the water line measures 35 feet and 45 feet on deck.

Propulsion power for both the Commercial Clipper and the Commercial Express is supplied by three General Motors Diesel Quad multiple engine units, each of which is rated at 660 bhp at 1850 rpm. A Quad unit consists of four basic 6-cylinder engines mounted together and driving a single propeller shaft through a 4.4:1 reduction gear. Correct engine water temperature is maintained through separate closing cooling systems for individual Quads, each system having its own shell and tube heat exchanger.

Basic engines have individual clutch and throttle controls so that under light load conditions one or more engines in a unit may be shut off for more economical operation. If necessary, basic engines could be quickly disconnected and replaced either enroute or at port during loading, thus obviating costly lay up time while repair work is being performed. Hatches directly over the engine room facilitate quick removal or exchange of any engine.

Engine room of the Commercial Clipper showing two of the three GM Diesel Quad propulsion units.

Although this power plant is capable of delivering over 2,000 bhp at a governed speed of 1850 rpm, each of the three "Quad 6" units measures only 4½ feet by 10½ feet and 4½ feet high.

Each of the three 60 inch controllable pitch propellers is driven at 415 rpm by a separate Quad engine unit. Since there are no reverse gears, backing is accomplished by simply reversing the propeller pitch by means of a hydraulic mechanism. Engines need not be throttled down when this operation is performed. The controllable pitch feature, in addition to providing greater

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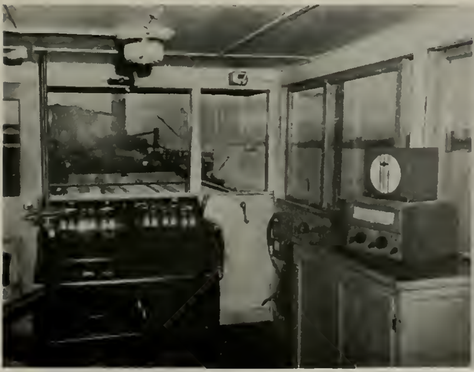
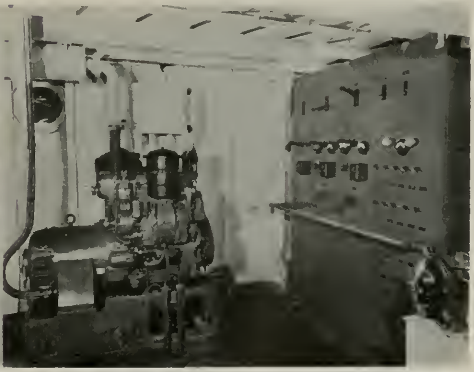


Bridge of the Commercial Clipper showing propeller pitch controls, throttle controls, intercommunicating telephones and radio.



One of the three GM diesel driven 30 kw generators and electrical power panel.

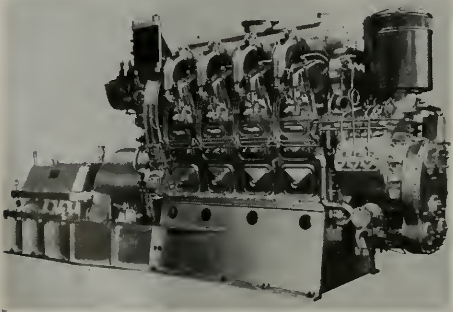
New Sinclair Oil Tanker, the F. C. Randall, re-built for service in hard-to-get-to ports of Cuban and South American waters.

War Techniques Used in New Shallow Draft Tankers

THE SINCLAIR REFINING COMPANY, drawing on its wide experience in product distribution, has taken advantage of available postwar trends in small tanker design to expand coastwise operations in Cuba and South America, with particular emphasis on operations in shallow ports.

To widen its distribution within such "hard-to-get-to" ports, Sinclair has acquired the newly constructed F. C. Randall, a tanker of the YO class which was contract termination inventory in the Smith Shipyards, Pensacola, Florida, after cancellation by the United States Navy. The vessel was purchased by Marine Industries and later sold to Sinclair Refining Company for operation by Sinclair of Cuba. The Gibbs Corporation of Jacksonville, Florida, rebuilt the tanker to meet Sinclair's special needs.

Sinclair was particularly interested in this type of tanker, being aware that the Navy used a long string of vessels of this type when establishing a beachhead or when entering shallow ports with needed supplies. Sinclair was also interested due to the fact that this tanker is of modern construction and is amply powered; being equipped with steam coils and a smothering system for handling heavy petroleum products as well as molasses in bulk cargo. In addition the vessel is well protected with CO2 fire fighting equipment.

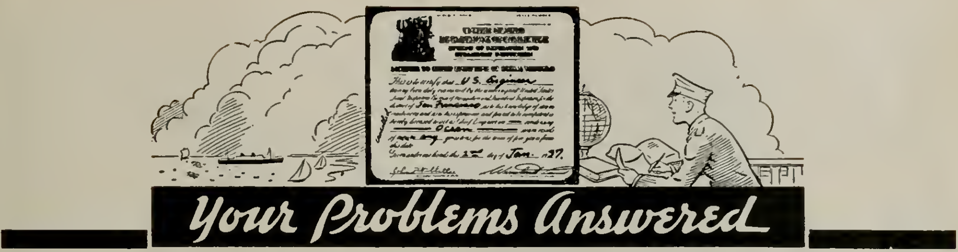


The F. C. Randall's Model 8-278A General Motors diesel engine, rated at 640 bhp, turns the propeller at 221 rpm, through Airflex clutch-reverse-reduction-gear mechanism.

Now in service, the F. C. Randall is of all-welded steel construction, and measures 216′ 6″ in length, overall; with a molded beam of 32′ and molded depth of 15′; capacity, 10,000 barrels of gasoline plus approximately 50 tons of fuel oil and 14 tons of fresh water at maximum draft of 13 feet. It is powered by Cleveland Deisel Engine Division of General Motors Corporation with a Model 8-278A diesel engine, rated 640 bhp at 675 rpm of the engine, turning the three-blade bronze propeller, 90 inches in diameter by 56 inch pitch, at 221 rpm through an Airflex clutch-reverse-reduction-gear mechanism.

Other equipment used in the operation of this oil carrier includes a diesel cargo pump; combination 40 kw. cargo pump and generator; two air compression pumps, 600-pound working pressure; a 20-gpm centrifugal fresh water pump; bilge pump, 100 gpm at 1250 rpm; a 50 gpm flushing pump and a steam generating plant. There also is electric steering; and the usual type air whistle characteristic of a motor vessel. The galley is spacious and well equipped with a three-gallon stainless steel coffee urn with contact electric heater; a large electric refrigerator, as well as a 30-cubic foot electric refrigerator and deep freeze unit. The vessel carries a

(Please turn to page 134)



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

Modern Marine Boiler Auxiliaries

STEAM FROM A BOILER, having done its work in the turbine or reciprocating engine, goes into another phase of its cycle in which it is reduced to water and prepared for entrance into the boiler again at the most advantageous pressure and temperature for the best economy of the particular installation. Therefore, every piece of apparatus between the exhaust outlet of the turbine and the feed water inlet of the boiler may properly be called a boiler auxiliary, considering the condenser as a 50-50 auxiliary half boiler, half engine.

Starting then with the condenser we have a low temperature heat exchanger consisting of a large nest of tubes contained in a cast iron or cast steel shell and so arranged that a fairly high vacuum can be maintained in the shell and cold salt water can be pumped through the tubes while steam is pouring down over these tubes from the exhaust. Important points in the operation of steam exhaust condensers are:

(1) That all joints between tubes and tube sheets and between tube sheets and shell be kept tight.

(2) That any split or punctured tubes be blanked out as soon as discovered.

(3) That inlet ends of tubes be examined periodically so that steps can be taken to prevent erosion and, if necessary, to renew tubes.

The engineer should secure for his personal use from the manufacturer an instruction book covering the condenser installed on his ship. He should also find out the make and material of the condenser tubes used and write the maker of those tubes for complete information. He should be supplied with the proper tools for making tubes tight and with ample spare ferrules and packing, if packing is used.

Condenser tubes in most modern condensers are made of copper nickel or aluminum brass alloys, which are much less subject to corrosion than the former standard Admiralty metal tubes. Any brass, however, is subject to dezincification when exposed to salt water that is contained in an iron shell. This is due to electrolytic action and is largely preventable by the use of zinc wasting plates fitted in the water boxes.

All of this is to prevent salt water getting into the steam which is particularly harmful in a water tube

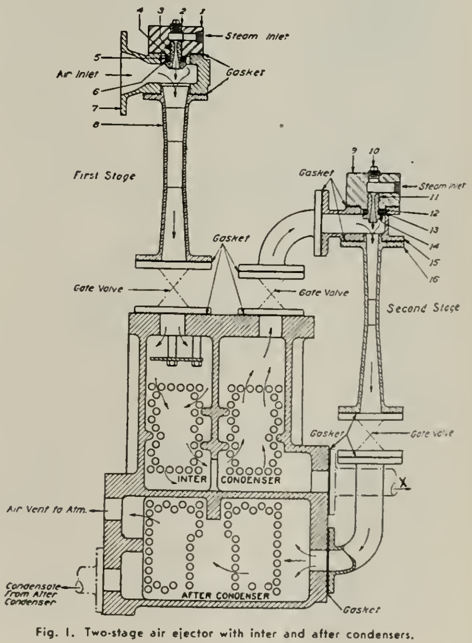


Fig. 1. Two-stage air ejector with inter and after condensers.

boiler installation. Such leakage is discovered by making frequent tests of the condensate for salinity. Many modern vessels are fitted with salinity indicator systems having connection to the hotwell and flashing a red light and ringing an alarm when salt concentration becomes dangerous. However, notwithsanding the presence of such a system, it is wise and safe procedure for the engineer to take a salinity reading every 15 minutes while underway.

When a condenser is idle it should be thoroughly dried out both on salt water and steam sides. If impracticable to dry out the tubes, the salt water side should be kept full and fresh circulation water pumped through occasionally.

Serving the condenser are two important auxiliaries:

(1) The air ejector for maintaining the vacuum in the shell; and

(2) The condensate pump which draws the condensed steam from the bottom of the condenser and starts it on its way to the main feed pump and the boiler.

In the great majority of modern steam plants an air ejector takes the place of the old air pump, Figure I, illustrates the two stage air ejector with inter and after condensers which is the type most commonly used in American 450 psi marine steam plants. Simply stated, the air ejector is a steam nozzle discharging a high velocity steam jet through a mixing chamber into a venturi tube diffuser, which may discharge into a condenser or into the atmosphere. In the two stage variety the first stage discharges into an inter-condenser and the second stage takes its suction from the inter-condenser and discharges into an after-condenser as shown (Fig. 1). The condensers in an air ejector are the start of the regenerative feed water system. Cooling water for these condensers is the condensate from the main condensers, which picks up here a few degrees of heat. The condensate from these air ejector condensers goes to the hotwell of the main condenser adding a little heat to the feed water. Figure 2 shows a complete regenerative closed feed water system with bled steam from various stages of the turbine piped to the essential heat exchange functions and drains from those functions piped to convenient stages of the feed water cycle. The usual marine 450 psi plant has three bleed points approximotely 100 psi absolute 25 psi gage, and 8 psi absolute.

One hundred pound bled steam is used in the third stage feed water heater and in the evaporators. Twenty-

(Please turn to page 138)

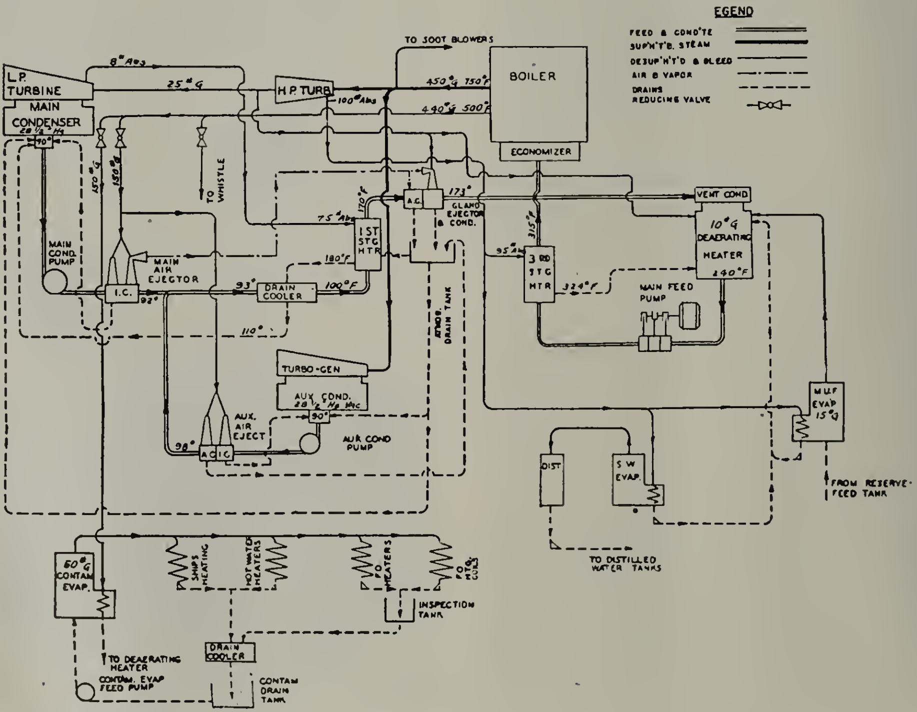
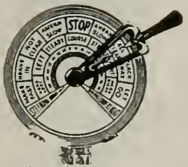


Fig. 2. Modern closed feedwater circuit with bled steam from main turbine serving the heaters.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE SEXTANT

CHAPTER X

(THIS IS THE CONCLUDING CHAPTER IN A SERIES ON THE SEXTANT, WHICH HAS RUN THROUGH 1946-1947)

Practical Notes on the Care of the Sextant

AS WILL HAVE BEEN GATHERED from the foregoing articles on the Sextant, it is a most important and somewhat delicate instrument requiring a good deal of personal care, handling and attention. It is hoped that the following notes will supply the navigator with hints and tips on all the points which will assist him to take the greatest care of his sextant and keep it in the best adjustment.

As the sextant is the best friend you will have at sea, treat it with respect. The old saying is—

Never lend your sextant—
Never lend your wife—

Buying a Sextant

When buying a sextant, particularly a new sextant, the maker's name will be sufficient guarantee of the quality and accuracy of its construction. BEWARE OF A SECOND-HAND SEXTANT UNLESS IT HAS BEEN FULLY CHECKED BEFORE YOU PART WITH YOUR MONEY.

In buying a second-hand sextant the following points should be watched. Suppose, for instance, you see advertised a sextant, and that you make an appointment with the seller and call on him. Immediately he will begin to extol the qualities of the sextant in the manner following: "This is a beautiful instrument; my grandfather used it, my father used it, and I have used it for several years. It is a wonderful buy for $250.00. Just give me the money and be on your way, etc., etc."

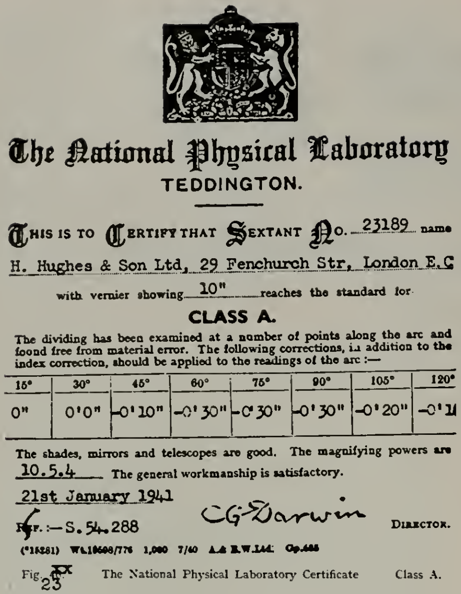
Now here is a little free legal advice that will save you money—and grief. Before you say more than how-de-do to the seller, ask him:

"Have you a Certificate of Inspection for this sextant? If so, where is it? Has is been pasted on the inside of the lid of the sextant case?" If so, examine it, and examine it carefully. If the seller is a "slicker" he may have picked up a Certificate of Inspection that belongs to some other sextant entirely. *Check this Certificate of Inspection with the sextant.* Does it describe the sextant you are planning to buy? Has it the same serial number? Does it contain the name of the same manufacturer that is engraved on the sextant? What is the date of the certificate?

Before you part with any money for a second-hand sextant, even after you have checked the Certificate of Inspection, insist that either the seller or you take this sextant to any reputable instrument concern and have it thoroughly checked. Between the time the Certificate of Inspection was issued and the time you look at it, it may have been dropped on the deck; thrown at the ship's cat, or used by the seller's wife to pound a nail in the wall on which to hang a picture. *Any one of these uses to which a sextant is put will utterly ruin it for navigational purposes.* A thorough check of a sextant will cost from $15.00 to $25.00 but will be money well invested. Anything wrong with the sextant will come out in this check-up.

See that the glasses in the shades are not slack. Reverse the instrument and see if the true and reflected arcs are in the same continuous line. Note whether the arc is well cut, as this is often worn by constant polishing; if it is, reject the sextant at once. See that the screws on the index mirror and horizon glass are in working condition and not all worn away. Examine the silvering on the mirrors.

If you are going to use the sextant for deep-sea work be sure that you have the proper telescopes. Unless your



The National Physical Laboratory
TEDDINGTON.

THIS IS TO CERTIFY THAT SEXTANT No. 23189 name
H. Hughes & Son Ltd, 29 Fenchurch Str, London E.C
with vernier showing 10" reaches the standard for

CLASS A.

The dividing has been examined at a number of points along the arc and found free from material error. The following corrections, in addition to the index correction, should be applied to the readings of the arc :—

15°	30°	45°	60°	75°	90°	105°	120°
0"	0'0"	-0'10"	-0'30"	-0'30"	-0'30"	-0'20"	-0'1

The shades, mirrors and telescopes are good. The magnifying powers are 10.5.4 The general workmanship is satisfactory.

21st January 1941

Ref. :—S.54.288 C G Darwin DIRECTOR.

(*15281) Wt.10608/776 1,000 7/40 A.& E.W.Ltd. Gp.485

Fig. 23 The National Physical Laboratory Certificate Class A.

Fig. 23. Certificate of Inspection issued by The National Physical Laboratory, London.

sextant will pick up stars without difficulty it is no good nowadays.

If possible buy a new sextant and take care of it—with proper care it will last a lifetime.

Using The Sextant

When holding the sextant many men prefer to grasp the frame of the sextant around the handle as well, thus getting a firmer grip.

When clamping the index arm the clamp screw should not be forced down hard, just tight enough to prevent the index arm slipping so that the tangent screw will act.

Do not strain the tangent screw by allowing it continually to get to the end of the thread.

Always rub over your sextant lightly after use—particularly in damp weather—with a piece of chamois. This will prevent the silvering from being damaged and keep your sextant in good working order and condition for years. Be careful to rub the arc dry at the same time.

When taking sights in rough weather be careful to clean off the salt spray. After sunset and at night moisture may form on the mirrors, which should be removed. Remove all moisture from the dividing line between the plain glass and the silvered glass, otherwise the silvering will soon deteriorate and make star sights much more difficult.

Be careful not to apply excessive pressure on the mirrors or the adjustments may be upset.

The sextant should never be left exposed to the sun for longer than necessary, and between sights it is a good plan to stow it away in its box, or someone may knock it off on the deck.

The micrometer sextant must be carefully handled. Firm pressure must be applied to the release clamp, disengaging it carefully by firm pressure of the thumb and finger on the clamp. The arc and micrometer teeth must be kept clean in order to prevent any stiffness occurring in the movement of the index arm.

The working parts of the micrometer sextant should be lubricated with the special oil provided. This should be used sparingly to the underside of the large micrometer pivot screw, the micrometer screw bearing, and also to the rubbing surfaces of the arc.

In addition to adjusting the sextant and finding the index error, a periodical examination should be made as follows:

(1) See that the index arm moves freely along the arc—if not, send to the maker for an overhaul.

(2) Holding the sextant arc away, as for the first adjustment, see if the true and reflected horizons are in line, and if not, note the difference. Now move the index arm around the arc from one side to the other and see if there is any variation in the distance between the true and reflected arcs. If there is, the index mirror is bent and the instrument should be sent to the maker for an overhaul.

(3) Examine the sextant and see if the telescope is paralled with the arc (fourth adjustment); if not, either adjust or send to the maker for an overhaul.

(4) The vernier should be examined to see whether when zero exactly cuts a division on the arc the 10′ division on the vernier also coincides with another division on the arc. It should do this at several places along the arc, otherwise the sextant should be sent to the maker for overhaul.

Keep Your Sextant Away From Damp and Vibration

Do not keep your sextant in a drawer where constant jolting will probably alter the adjustments. If possible get a special shelf built fitted with side battens to prevent the box from getting any play when the ship is rolling.

An occasional rubbing of the arc (on the vernier sextant) with a weak solution of ammonia and water will brighten it so that it is easier to read. *Never use anything on the arc of an abrasive nature which will cut it.*

(Please turn to page 138)

On the Ways

New Construction - Reconditioning - Repairs

Six C-3's for Matson

Six C-3's assigned to Matson Navigation Company are to be converted to special needs of that firm by the addition of cargo refrigeration, deep tanks for molasses, and special cargo handling machinery.

General Shipbuilding and Dry Dock Company was successful low bidder on two of these vessels for a total cost of over $1,000,000. The other four will be converted on the Atlantic Coast or the Gulf.

Specifically each of the ships contracted to the General Engineering & Dry Dock Co. will be fitted for 60,000 cu. ft. capacity in refrigerated cargo chambers together with the refrigeration machinery to take care of this cargo.

The molasses will be carried in deep tanks with a capacity for 2700 tons. A pump room with machinery of adequate pumping capacity to handle this cargo will be installed. The ships' holds will be fitted to carry sugar in bulk. Topping winches will be installed to complete the cargo handling gear.

Progress on Passenger Liners

The two passenger liners, President Cleveland and President Wilson, building at the Alameda, California yard of the Shipbuilding Division, Bethlehem Steel Company, are rapidly nearing completion. The SS Cleveland is expected to run trials early in the summer and a number of executives and engineers of the Maritime Commission will be out from Washington to make special studies on this trial. Of particular interest to the engineers will be the strain gage tests on the aluminum superstructure of this vessel. These tests will determine to a large extent the usefulness of this light weight metal in such structural application.

Undoubtedly the first of this pair of vessels will be put through exhaustive tests as to all of her engineering and navigational functions, although these should be identical with those of her sister vessels that were used as troop transports during the war. The only new feature to be tested is the aluminum superstructure and this test data

"GOOD NEIGHBOR" LINER COMES BACK

The SS Argentina, which served as a troopship during the war, enters a 25,000-ton floating drydock — the largest in the country — at the Bethlehem Brooklyn Division yard. The vessel is being reconverted for peacetime service by the U. S. Maritime Commission. By mid-summer the 587-foot, 20,614-ton ship will emerge again as a luxury liner, to be operated on the "Good Neighbor" run to east coast South American ports by the Moore-McCormack Lines.

will be awaited with keen interest by all naval architects. On a sea trial of one of the sister vessels built in this same yard we found her to be an eceptionally good seagoing model, easy in her roll and pitch, and able with her electric twin-screw drive to spin around practically in a circle with a diameter scarcely exceeding her own length.

Liner Plans Deferred

A number of American steamship lines have long range plans for special passenger liner and combination passenger and cargo liner construction that are, at present, deferred awaiting final rulings on taxes by the Treasury Department, and on subsidies by the Maritime Commission. Among these are American President Lines, American Export Lines, U. S. Lines, and American Mail Lines.

Designs for these vessels are practically complete and the necessary reserve funds for their construction are on hand pending the decision by government agencies on several important factors. If the government insists on payment of income taxes covering these funds, a decision that would be based on a very flimsy technicality, then of course the remainder would not be sufficient to warrant going ahead with the work. If the Maritime Commission decides against adequate construction differential subsidy that also hamstrings the plans. So both the shipping and the shipbuilding industry are temporarily, at least, "out on a limb" so far as new construction is concerned.

Todd Reconverts Puebla [Ex-Orinoco]

The former German passenger liner, Orinoco, interned early in the war by Mexican authorities, was chartered early in 1942 to the United States and with her name changed to Puebla, turned over to the Army in New Orleans, for use as a transport hospital. On her way round to San Francisco trouble developed in the M.A.N. diesel engines of her electric generating sets. At San Francisco these engines were replaced by Enterprise diesels and the ship went into hospital transport service on the Pacific.

In 1944, after repeated trouble with her main engines (Bremer-Vulcan) she was laid up at Bethlehem, San Francisco Yard, and her engines completely rebuilt. After further service she was sold to the Southern Steamship Company (Olympia Line) of New York, which is headed by Markos P. Nomikos, a Greek shipowner, who had the vessel reconverted to a passenger liner at Todd's Brooklyn Division yard. This job was completed on February 7 and the Puebla, later to be named Olympia, delivered to her owners.

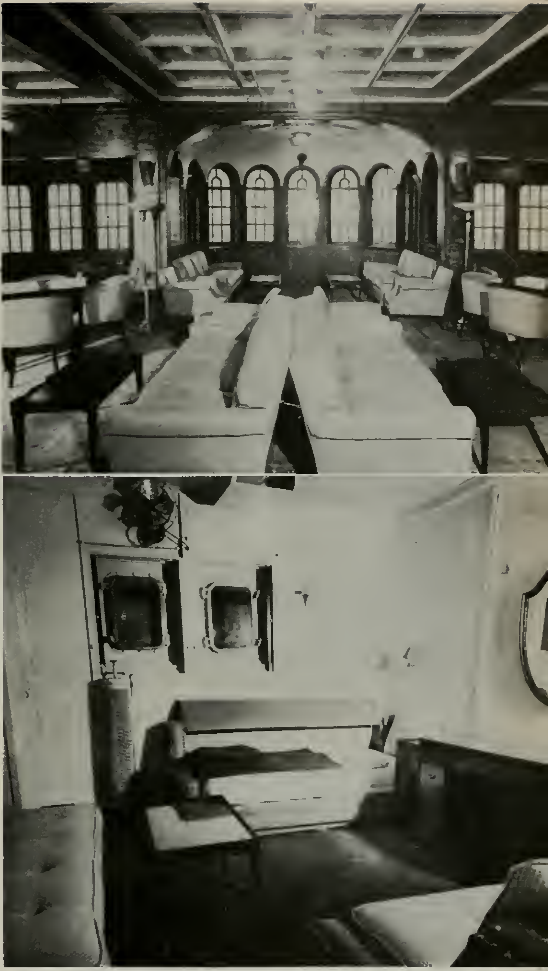
This vessel is about the same size and horsepower as a C-3. She is 485′-6″ long, 60′-11″ beam, 34′-1″ depth and her diesel engines generate 8000 hp. She probably makes 16 knots speed.

As now fitted, she will carry 626 passengers in five classes: 68 in de luxe suites, 125 in first class cabins, 118 in second class cabins, 134 in tourist class rooms, 181 in third class berths. Our illustrations show the furnishings and the general appearance of this ship.

Passenger liner, Puebla, ex-Orinoco, leaving Todd's Brooklyn yard.

Public rooms on the recently reconverted passenger liner Puebla are noteworthy for simplicity and good taste in the decorative treatment and the furnishings. Our illustrations show (top) the first class lounge and (below) a de luxe class cabin.

The reconverted passenger liner Puebla leaving Todd's Brooklyn Yard, assisted by three tugs. This vessel, the former German liner Orinoco, was converted to an Army transport hospital for war use and now is reconverted for passenger service with the Olympia line, New York.



Aluminum Hulls Proposed

The Aluminum Company of America is proposing to build two all-aluminum comparatively shallow draft vessels to transport bauxite ore from their mines in Dutch Guiana, to Trinidad, British West Indies, where it will be transferred to deep draft vessels for transport to American ports. The first proposed vessel will have an overall length of 422 feet, a beam of 60 ft., a depth of 28 ft., and a maximum draft of 20 ft. She will have a deadweight capacity of 8143 tons on a displacement of 10,232 tons. The second vessel as designed will have a length overall of 348 feet, a beam of 54 feet, a depth of 27 feet, and a maximum draft of 19 feet. Her maximum deadweight capacity on 6730 tons displacement will be 5101 tons.

Such figures will be very interesting to naval architects if these vessels in sea service measure up to the expectations of their designers. Alcoa has carried on much painstaking research into the problems of the adaptability of aluminum and its alloys to marine structures and are to be commended for their courage in planning this full size demonstration in actual service conditions. The success of this demonstration might well revolutionize merchant ship design and construction.

Gibbs and Cox have worked out the design details for the larger vessel and George E. Sharp has charge of the design of the smaller one. Bids are being invited this month.

Hospital Ships Converted

Todd Shipyard Corporation, Seattle Division, is nearing completion of its contract to convert two former naval combat hospital ships into Army transports. These vessels were the Rixey and the Tryon, built by the Moore Dry Dock Co. during the war and used as combat evacuation vessels. They were decommissioned last year and taken over by the Seattle Port of Embarkation, total contract price for the two conversions is over two and a half million dollars. Both ships are to be turned over to the San Francisco Port of Embarkation.

Converting a Victory

The Kaiser Company at the Swan Island yard, Portland, Oregon, is converting a Victory type steamer into a bulk carrier of cement and or miscellaneous rock for the Permanente Cement Co.

Holds No. 2, 3 and 4 of this vessel will be changed into hoppers with bottoms sloped at a 45° angle. Holds No. 1 and No. 5 will be fitted with cargo conveying machinery. Deck piping will be installed for connection to 10 inch flexible piping running ashore for the loading of cement. Four tunnels will be constructed, two forward

(Please turn to page 138)

Converse M. Converse's yacht Dorsal takes on unusually large supply of fuel and lubricants at General Petroleum marine station at Los Angeles Harbor.

Intercoastal Yacht Trip

THE FIRST POSTWAR COAST-TO-COAST yachting excursion to leave the Los Angeles area got under way when Captain R. C. "Dick" Wilson took out Converse M. Converse's 80-foot diesel yacht Dorsal on the first leg of a non-scheduled journey that ultimately will reach New York.

Converse's yacht Dorsal leaves Los Angeles Harbor on first post-war Coast-to-Coast yachting excursion.

Leaving Wilmington, the Dorsal will proceed to Ensenada for its Mexico papers, then touch at Mazatlan and Acapulco to which port Mr. and Mrs. Converse will fly to join the craft.

The Dorsal will then proceed to Panama after touching ports in Guatemala, El Salvador and Costa Rica. Transiting the Canal, Mr. Converse will be joined by his brother, George, who has been cruising in the Caribbean aboard his yacht Aeolus, and the two yachts will continue together in that sea, fishing and cruising among the islands and stopping at Kingston, Havana and Miami. With the coming of stormy weather in the Florida area, they will proceed via the inland waterway to New York. Mr. Converse is a member of the New York and Newport Yacht Clubs, as well as of the Santa Barbara and California Yacht Clubs. He is also president of the Santa Barbara Polo Association.

The Dorsal is 80 feet in length, with 15-foot beam and draws seven feet of water. It is powered by two 200 hp General Motor diesels. Its range is 1061 miles and it carries a crew of four.

An interesting feature of the final preparations was the loading of an unusual supply of diesel fuel and lubricating oil at the General Petroleum marine station in Wilmington where 3625 gallons of fuel and 100 gallons of lubricating oil, some of which had to be stored on deck, was taken aboard. General Petroleum and Socony-Vacuum have arranged a fueling itinerary along the entire route for the Dorsal.

Running Lights

Edited by B. H. BOYNTON

Aerial photograph of the Sunnyvale plant of the Joshua Hendy Iron Works, which will be operated by the Westinghouse Electric Corporation under a lease agreement for ten years with option to buy.

Westinghouse Gets Joshua Hendy Plant

Westinghouse Electric Corporation will take over operation of the Sunnyvale, California, plant of the Joshua Hendy Iron Works under a lease arrangement.

Westinghouse is entering into a 10-year lease with option to purchase the California plant, according to a joint announcement by John A. McCone, president of Joshua Hendy, and Harry F. Boe, vice president in charge of the Westinghouse Manufacturing and Repair Division.

The 57-acre plant will be operated under the direction of Mr. Boe and will become the largest of 37 manufacturing and repair plants which Westinghouse operates in 25 states, in addition to its principal manufacturing divisions. Other West Coast plants in the Westinghouse "M & R" Division are at Los Angeles, Emeryville, Portland, and Seattle.

With its 900,000 square feet of floor space, the Sunnyvale plant becomes a major Westinghouse manufacturing unit. Westinghouse plans to take over actual management of the plant about March 1.

In addition to carrying on Joshua Hendy's present production of such heavy equipment as pipe line valves and smaller types of steam turbines, Westinghouse plans to expand its operation by adding new products now being manufactured in a number of other Westinghouse plants. The Sunnyvale plant's present employment figure of 1100 people will be increased when the operation gets into full swing, according to Mr. Boe.

During the war, the Joshua Hendy Iron Works was licensed by Westinghouse to use its plans and processes to produce marine turbines and gears.

Organized in 1856 as a metal fabricating concern, Joshua Hendy employed at wartime peak approximately 9000 employees. On the 57-acre plant site which adjoins the main line of the Southern Pacific Railroad are located seven manufacturing buildings, an office building, and a cafeteria. Four of the manufacturing buildings were built during the war, including two modern machine shops. Among the other structures is a large foundry.

Ed. S. Hochuli, as manager of Marine Sales.

General Petroleum Names Marine Sales Manager

The appointment of Edward S. Hochuli as manager of Marine Sales for the Northern California Division of General Petroleum Corporation was announced by B. F. Ball, Division Manager. Mr. Hochuli, who assumed his new position the first of February, has had a varied background of seafaring experience in both the merchant marine and the Navy. He goes to his San Francisco assignment from Los Angeles, where he has long been affiliated with the company. During the war he served as assistant supervisor in charge of education for the U. S. Merchant Marine Cadet Corps, and in overseas combat, where he was in command of an undersea demolition team.

Cleveland Diesel Promotions

George W. Codrington, general manager, Cleveland Diesel Engine Division, General Motors Corporation, Cleveland, Ohio, announces the appointment of T. E. Hughes as general sales manager and B. H. Gommel as commercial sales manager. Mr. Hughes was for many years manager of the Washington, D. C., office, and Mr. Gommel was formerly service manager. Their headquarters will be at the division's plant in Cleveland, Ohio.

J. S. Melton has been transferred from the Cleveland office to Mr. Hughes' old post as manager of the Washington office.

All of these men have been with the company for many years and are widely known in the diesel engine industry.

Top to bottom: T. E. Hughes, general sales manager, Cleveland Diesel Engine Division, General Motors Corporation, Cleveland, Ohio; J. S. Mellon, manager, Washington office, and B. H. Gommel, commercial sales manager.

A Bendix Installation

BRYANT O'CONNOR, who is with Toumey Electric & Engineering Company of San Francisco (representatives for Bendix depth recorders on the Pacific Coast), recently went on a trial trip in Humboldt County on the Sportfisher II, owned by Milton A. Pellegrini of Eureka. A Bendix depth recorder was installed and Bryant was able to check on its performance during a bad spell of foul weather outside the bar.

Over the past year more than 60 installations of Bendix depth recorders have been installed in commercial fishing boats of the Pacific Coast.

George Ferry Joins Atlas Paint

George Ferry, well known in marine circles on this Coast, including years as a yacht skipper, has joined the Atlas Paint and Varnish Company Sales Department. He was formerly with West Coast Shipbuilding Company for some time.

George Ferry of Atlas Paint and Varnish.

At the head table, left to right: Peter Klemenkov of U.S.S.R. Consulate; Ed Mossawir, American Trust Company; Burton Abbott, California & Hawaiian Sugar Refining Co.; Herb Porter, Otis McAllister & Co.; Bob Prock, Atkin Kroll & Co.; R. H. Wylie, Brig. General (retired), speaker of the Day; Allan Eber, Polak Winters & Co.; Alvin C. Eichholz, Senior Chamber of Commerce; Bill Loomis, Senior Chamber of Commerce, and Maurice Knox, Polak Winters & Co.
General Wylie is the newly appointed manager for State Board of Harbor Commissioners, San Francisco.

World Trade Committee of San Francisco Junior Chamber Welcomes General Wylie

▲
Speaker at the Junior Foreign Trade Meeting W. H. Wylie, Brig. General (Ret.), talked on the Importance of San Francisco's Harbor and touched upon a plan for its development. At left: Bob Prock, Atkin Kroll & Co. On the right of General Wylie is Allan Eber, Polak Winters & Co.

General view of the meeting.
◄

White Bros. Executives

In February Pacific Marine Review there appeared a story of the 75 years of service to shipping of White Brothers, San Francisco hardwood headquarters. Here are shown officials of the company.

W. T. White, president of White Bros. and C. H. White, vice president and general manager. ◄

Don White of White Bros. ►

Left to right: Wm. T. Mayer and Keith McLellan of White Bros.

Sterling Engine's Pacific Coast Sales Manager

The appointment of W. Edgar Martin as Pacific Coast sales manager of the Sterling Engine Co., of Buffalo, N. Y., effective March 1, 1947, was announced by Hans Bohuslav, Sterling vice president. Mr. Martin will make his headquarters at the company's San Francisco offices, 1040 Bryant St.

Widely known to the marine industry throughout the West, "Eddie" Martin joins Sterling after a long period of service to the industry for the Westinghouse Electric Corporation, more than 20 years of which were spent on the Pacific Coast as Marine Department representative, headquartered at San Francisco.

A native of Brooklyn, N. Y., Mr. Martin attended grade and high schools in Denver, Colo., then graduated from the University of Colorado as a Bachelor of Science in Electrical Engineering. Soon after graduation, he joined Westinghouse at East Pittsburgh, Pa., as a graduate student, and later became one of the first members of that company's Marine Department.

In 1920, he took a post-graduate course in Carnegie Institute of Technology at Pittsburgh, and in 1922 was transferred to the West Coast where he has served since as a marine representative.

In his new post, Mr. Martin will have charge of the sale of Sterling's complete line of diesel and gasoline engines of medium horsepower for both marine and stationary applications, throughout the Pacific Coast territory.

Marine Insurance News

CHANGES AT HOME INSURANCE

A further change in the Marine Department of The Home Insurance Co., New York, is the transfer of Marine Special Agent John V. Beahrs from Los Angeles to the San Francisco office where his duties will be that of Underwriter supervising Ocean Marine writings.

Due to the increase of business and in line with the Home's wish to improve service to their producers, Marine Special Agent Victor H. Winkel is taking over the supervision of Inland Marine underwriting in the San Francisco office, his place in the field being filled by Marine Special Agent David J. Gaggero.

MATHEWS & LIVINGSTON, recently announced the removal of their San Francisco offices, March 1, 1947, to 317 Montgomery Street, California Commercial Union Building, ground floor offices, San Francisco.

Left to right: Commodore L. L. Bennett, USCG; Leonard T. Backus, first vice president, Los Angeles-Long Beach Propeller Club; and E. A. MacMahon, Luckenbach Steamship Co., president of the Propeller Club; Stafford S. Harlow, third vice president; and Rear Admiral Albert W. Marshall, USN, ret., honorary member. He presented the club with the Ship's Bell a few months ago.

Propellers of Southern California Saw Training Film

At right, above: Left to right; Max G. Linder, Transmarine Navigation, past president of the Propeller Club; Ralph M. Hylton, De La Rama Steamship Co.; R. D. Kingsbury, De La Rama Steamship Co.; and Lloyd Roberts, Los Angeles Harbor Department, who showed the Training of Maritime Cadets film featured at this meeting. ▶

At right: Dan Brennan (standing) graduate of the San Mateo Maritime Service Cadet School gave a short talk after the film was presented to the club members. Included in this group are M. A. Richley, formerly with Pope & Talbot, now retired; D. M. Hodges, Foster Wheeler Corp.; and Martin Faerber, American Pacific Steamship Co. ▶

Below, left: E. J. McKee, Naval Fuel Annex, San Pedro; Lawrence Wolff, Union Oil Co. of California; Lt. Comdr. A. F. Walthew, Naval Fuel Annex; Captain Lester L. Lishman, Union Oil, port captain; and G. F. MacDonald, Luckenbach Steamship Co.

▼

Below, right: Front row: Left to right: Roy W. Crosby, visitor; Robert O. Vernon, Lloyd Shipping Co., (in back row: Mr. Lishman, G. F. McDonald, Harold R. Pauley, Board of Governors, Propeller Club, and A. E. Gram, Marine Exchange); W. A. St. Amant, Board of Governors of the L.A.-L.B. Propeller Club and W. J. Sweeney, Parry Navigation Co. ▼

W. O. A. M. M'S Hear Shipping Executive

K. C. Tripp, West Coast manager, Moore-McCormack Lines, Inc., was the featured speaker at the February meeting of the Port of San Francisco, Women's Organization for the American Merchant Marine. Left to right: Mrs. Duane Tweeddale; Mrs. Alfred Pittman; Mr. Tripp; Club President, Mrs. Harry W. Parsons; Mrs. J. F. Johnstone; and Mrs. Harvey.

Staterooms of Glass

The modern ship, with fireproof paneling, fire bulkheads and alarms has gone far toward control of major fires. Still uncontrolled, however, is the fire that starts in a stateroom, even though it travels no further than the confines of the room itself. Renovating is a considerable expense to which must frequently be added loss of passenger revenue.

Fireproof fabrics or treated cloths have been available for some time, but they have not lent themselves to good decorative treatments. Passengers want and now expect their living quarters to be attractive to the point of being luxuriant. So naval architects and decorators have had little choice but to use conventional fabrics throughout the interiors.

Rapidly advanced during and since the war, products made of Owens-Corning Fiberglas textiles now provide the medium for both safe and decoratively beautiful furnishings such as port curtains, drapes, lamp shades, pillows, mattress covers and even complete box and inner spring mattresses. Many new developments now on the horizon will shortly make it possible to completely furnish a stateroom in GLASS.

In addition to its being non-combustible, Fiberglas will not mildew nor absorb moisture, is vermin proof, colorfast, easily cleaned and durable. Pillows and mattresses are a boon to alergy sufferers, are extremely light and will remain so, as they cannot gain weight by moisture absorbtion.

Mattress covers give, to a very large extent, the same qualities to the conventional mattress on which they are designed to be used.

These items are made available in San Francisco by Glass Fiber Products, a subsidiary of White & Holcombe, who specialize in the marine field.

White & Holcombe Acquire Loft at Pier 5

Of interest to the marine field is the announcement of White & Holcombe, sailmakers at Pier 7, San Francisco, that they have recently acquired Louis Ottesen Company loft at Pier 5.

They will operate both lofts and will retain the name of Louis Ottesen Co., as well as their own.

Robert J. White was formerly associated with the Army Transport Services in an executive capacity in San Francisco. Gordon B. Holcombe has been connected with various steamship lines for the past 20 years, among which were the American Mail Line, Dollar Line, K. P. M. Line and Matson Navigation Co.

Pacific Far East Line Appointments

Al Wenderoth and George H. Nash were named assistants to the traffic manager of Pacific Far East Line, Inc., effective March 1st, Thomas E. Cuffe, executive vice president announces.

Mr. Wenderoth resigns as assistant general freight agent of American Hawaiian Steamship Company of San Francisco to take his new post. During the war, he was a Commander in the Navy. Before going with American-Hawaiian many years ago, he was with General Steamship Corp., Ltd. and prior to that with Dollar Steamship Lines.

Mr. Nash held the position of San Francisco manager of Judson Sheldon Division of National Carloading Corp. until his appointment to Pacific Far East Line. During the war he served with the British Ministry of War Transport and prior to that as traveling representative of the Port of Oakland.

The 1947 officers of the Society of Naval Architects and Marine Engineers were nominated at the February meeting. Left to rgiht: H. P. Champlain, vice president, is Division Marine Supt. for United Fruit Co.; Incoming President, W. B. Warren, Principal Surveyor on the Pacific Coast, American Bureau of Shpping; Captain R. O. Myers, USN., Morris Weitzner, on Executive Committee; Robert D. Miller, speaker of the February meeting, who told his experiences as observer at Bikini; and Gordon W. Colberg, assistant naval architect, Standard Oil Co. of California.

Naval Architects Nominate For 1947

The Northern California Section of the Society of Naval Architects and Marine Engineers, at the February meeting in San Francisco, heard delivered addresses by two Navy men, and received the report of the nominating committee.

Sewell A. Knapp, general superintendent, Moore Dry Dock Company.

The first address was the "Activities of the Office of Naval Research" by Captain R. O. Myers, USN, Commanding Officer of the San Francisco Branch of the Office of Naval Research. He was followed by "The Story of Bikini" by R. D. Miller of the San Francisco Naval Shipyard, who illustrated his talk with pictures taken before, during and after the Explosions.

Nominated for President is W. B. Warren, who is Principal Surveyor on the Pacific Coast for the American Bureau of Ships. Vice President is H. P. Champlain, who is Division Marine Superintendent for United Fruit Co. Secretary is Lester White, Chief Surveyor, C. & R. Department, Matson Navigation Co.

Lester White, chief surveyor of C & R Department of Matson Navigation Co., incoming secretary of Society of Naval Architects and Marine Engineers.

Sewell A. Knapp, general superintendent, Moore Dry Dock Company, is nominated for a vacancy on the Section's executive committee, the others being: M. Weitzner, Bethlehem Steel Company, the retiring chairman; Harvard P. Stewart, Bethlehem Steel Company; and C. M. LeCount, General Electric Company.

Shoreside Personalities

▲ Aboard the ferryboat, Sacramento, during the General Electric radar demonstration, left to right: Henry Becker, American President Lines' naval architect; C. M. Le Count, General Electric Co.; Charles R. Page, chairman, Fireman's Fund Insurance Co., and director, of APL; Hughes Ogilvie, General Electric Co.; E. Russell Lutz, executive vice president, APL; George L. Crow, GE; Thomas Cokely, operating manager, APL; Gene Hoffman, manager of Public Relations, APL; and Captain Walter G. Pearch, marine superintendent of APL.

Radar Demonstrated to Shipping Officials

Captain Carl Hawkins, American President Lines Assistant Operating Manager, exolaining an experimental radar set to Henry F. Grady (left) and A. Emory Wishon, president and director respectively of American President Lines, as the group crossed the Bay recently on the ferry boat Sacramento on which the radar set is installed. APL officials are studying the equipment of various companies with a view to installing this new navigational aid on their new postwar transpacific and Round-World liners.

▼

Left to right: Captain Walter G. Pearch, marine superintendent; E. Russell Lutz, executive vice president; Charles R. Page, director; T. J. Cokely, operating manager; and B. N. De Rochie, assistant publisher of Pacific Marine Review.

►

Captain Evans of G. E. Retires

Captain Joseph S. Evans, USN (retired) (center) was honored at a dinner in Schenectady, January 8, attended by high-ranking naval officers, General Electric executives, and shipbuilding officials. Captain Evans retired January 1 after 43 years' naval service, 18 of which were spent as naval inspector with the General Electric Company. Left to right are Vice Admiral E. W. Mills, chief of the U. S. Navy Bureau of Ships; Rear Admiral F. J. Willie, in charge of the Contract Division; Capt. Evans; C. H. Lang, vice president and manager of sales, Apparatus Department, G.E.; and Captain W. A. Brooks, present G.E. naval inspector.

T. H. Bossert, president and director and D. A. Williams, vice president and works manager, New York Shipbuilding Corporation of Camden, New Jersey.

New York Ship Elects

J. F. Metten, chairman of the Board of Directors and chief executive officer of New York Shipbuilding Corporation, Camden, N. J., on January 27 announced the following changes in officers and directors:

T. H. Bossert, elected president and director and

D. A. Williams, elected vice president and works manager.

N. R. Parker will continue as vice president and treasurer, and was also elected director.

Mr. Bossert began his shipbuilding career as an apprentice draftsman in the Hull Drawing Room of New York Shipbuilding Corp., in 1908 and graduated from the Franklin Institute, Philadelphia, Pa., in 1912. He has been with the New York Shipbuilding Corporation since 1930 as Naval Architect and in 1942 was made Vice President of the Corp. He is a member of the Society of Naval Architects and Marine Engineers and of the American Society of Naval Engineers.

Mr. Williams graduated from Franklin & Marshall College in 1917 with a B. S. Degree. He has been with New York Shipbuilding since 1919, as foreman, Hull Department. Subsequently, assistant foreman, Production Department; Head of Inspection Department; General Foreman, Hull; assistant superintendent and superintendent, Hull Department; and assistant general manager in 1942.

Five-Foot Fenders

The fender shown in the illustration is used by the vessels of the Moore-McCormack Company and the Pope and Talbot Company on the Buenos Aires run. Each vessel sailing into this port carries two of these which are held in position over the ships side by means of a wire rope cradle, which in turn is fastened to a deck bollard. One of the port regulations at Buenos Aires requires that all vessels when moored alongside the dock must remain a distance of about 5 feet from the dockside and many vessels which do not have the required fenders on board, have to rent those of the port authority at quite a considerable cost.

This special type fender was designed and manufactured by Vic Knudsen, ship rigger of San Francisco, to meet the special requirements of the two shipping companies. It consists of a circular core of Oregon pine, 26 inches in diameter and ten feet long. The bumper portion is made up of five airplane tires, five feet in diameter, each packed with manila rope, all recessed into the wood core a few inches, and held in place by a strong wooden collar at each end, reinforced by wood brackets. The total weight of each bumper is two and one half tons.

Ship's dockside fender for use at Buenos Aires with Inventor Vic Knudsen standing at left.

Shoreside Personalities

American Mail News

GILBERT HIBSON TO AMERICAN MAIL

Gilbert T. Hibson, former supervising port analyst of the War Shipping Administration and the U. S. Maritime Commission, has joined the American Mail Line as assistant freight traffic manager, with offices at San Francisco.

Mr. Hibson, a native of New York, has been on this coast since prior to the last war and after working for a short time for the Freight Division of the Western Pacific Railroad, joined the forces of the War Shipping Administration where he organized the West Coast Statistical and Research Division.

Gilbert T. Hibson of American Mail Line.

This entailed the recording of the movements and activities of all the vessels operated for the U. S. Government in the Pacific Area. In latter months of service with the U. S. Maritime Commission he assisted the Pacific Coast Director's office in handling administrative functions pertaining to Terminal and Stevedoring contracts. He will retain his position as President of the Maritime Commission Recreation Club until the fullfillment of his term in the fall of this year.

G. J. Ackerman, American Mail Line.

Ackerman Visits S. F.

G. J. Ackerman, operating manager, American Mail Line, Seattle, was on a recent trip to San Francisco, where he made a study of conditions prevailing on the change over of the American Mail Line from wartime to peacetime operations.

Mr. Ackerman states the American Mail Line will soon place in operation six reconverted ships of the C-3 class. These vessels will operate in connection with three vessels now in operation of the C-2's Island Mail, China Mail, and Ocean Mail, and will operate out of the Pacific Coast serving the Orient and Far East. Five of the nine American Mail ships will be equipped to carry refrigerated cargo.

The C-3 class vessels are to be re-named as follows: American Mail, Java Mail, Washington Mail, Oregon Mail, India Mail and Canada Mail.

▲ Alfred Johnson and John Logan of C. J. Hendry Co. ►

C. J. Hendry Promotion of John A. Logan

The C. J. Hendry Company announced, on February 10, through its President, Charles J. Dilke of San Francisco, the retirement of Alfred W. Johnson as manager of its San Pedro Branch. John A. Logan, formerly assistant manager succeeds Johnson as manager at this important unit of the Hendry Company.

After serving in the United States Navy during World War I, Al tried his hand, for a short time, at selling oil products. Hendry's had opened their San Pedro Branch in 1915, and believing that the Ship Chandlery business would share in the growth and progress of the Harbor, Al joined the company in 1919 as Shipping Clerk. In 1923 he became Assistant Manager and served in that capacity until 1937 when he was appointed Manager at San Pedro. In 1942 he was elected to the Board of Directors and became an Executive Officer of the company.

Jack Logan is well qualified by experience and training to represent Hendry in the Los Angeles-Long Beach Harbor District. Jack started working for Hendry's during High School vacations. The smell of tar and oakum must have gotten in his blood, for after graduating he took a full time job, and is still at it. After advancing through the various departments, he was appointed Assistant Manager in 1937.

H. G. Rethmeyer

Westinghouse Pacific Coast Marine, Aviation Manager

H. G. Rethmeyer, veteran of more than 20 years' service with the Westinghouse Electric Corporation, has been named manager of the Marine and Aviation Divisions of the corporation's Pacific Coast District. The announcement of Mr. Rethmeyer's appointment was made by Charles A. Dostal, vice president.

In his new post, Mr. Rethmeyer will take over the marine and aviation activities handled formerly by G. B. Rosenblatt. Mr. Rosenblatt is relinquishing managerial duties to devote full time to serving personally the company's major industrial and marine accounts throughout the district.

He is a member of the American Institute of Electrical Engineers and the Propeller Club, and also holds membership in several Masonic organizations including Nile Temple, Seattle. Mr. Rethmeyer was transferred to San Francisco from Seattle, Washington, where he had served the company's marine, transportation and central station accounts since early 1937.

Atlantic Mutual Establishes Offices in Los Angeles

The Atlantic Mutual Insurance Company and its wholly-owned stock affiliate, Centennial Insurance Company, have opened offices at 510 W 6th Street, Los Angeles. The new office is under the direction of James E. Crilly, Jr., who has had wide experience in the insurance business. He will be assisted by Richard V. Eastman, who will supervise the fire operations. Mr. Eastman has been active in the fire and inland marine insurance business in Southern California for the past 13 years.

The Atlantic Mutual is one of the oldest insurance companies in the United States. Founded in 1842 in the Clipper Ship era as the successor of the Atlantic Insurance Company, the firm has served merchants and shipowners on the Eastern Seaboard for more than 100 years.

The Atlantic and Centennial write practically all forms of policies which are common to marine and fire insurance companies, and later the company expects to introduce its affiliate, the Atlantic Mutual Indemnity Company, when automobile and general lines of casualty insurance will be undertaken.

James E. Crilly, Jr., manager of the recently opened Los Angeles office of the Atlantic Mutual Insurance Company and its wholly-owned stock affiliate, the Centennial Insurance Company. Mr. Crilly is in charge of Atlantic's Southern California operations.
A graduate of the University of California class of 1929, he was associated with the Firemen's Fund Group for sixteen and a half years, specializing in the writing of Inland and Cargo insurance.

Edgar M. Wilson, vice president, American President Lines at Los Angeles

APL Los Angeles Promotions

Edgar M. Wilson, general agent for American President Lines at Los Angeles, has been elected a vice president, in charge of all company operations in Southern California, it was announced by President Henry F. Grady. At the same time Mr. Grady announced the promotion of S. J. Hindle, assistant to the General Agent at Los Angeles, to the rank of Agent in charge of freight activities in the Los Angeles area.

Both men are veterans of many years service in the shipping business and with the Oriental and Round-the-World services.

Frank Groves Distributor For Foster Engineering

The Frank Groves Company on January 1 was appointed exclusive distributors for the Foster Engineering Company for the California, Oregon, and Washington territories. This is an extension of the Northwest territory heretofore handled by Frank Groves.

The Foster Engineering Company is well known to the marine trade and has a complete line of reducing valves, pump governors, regulators, and relief valves. The new arrangement was made by S. G. Farrington, general manager.

W. L. Aiken, recently appointed chief engineer Automotive and Marine Department, SKF Industries, Inc.

W. L. Aiken Joins SKF

William L. Aiken has joined SKF Industries, Inc., as senior division engineer in charge of the automotive and marine department, it is announced by the ball and roller bearing firm.

A graduate of the U. S. Naval Academy and Carnegie Institute of Technology, Aiken was executive engineer of the Autocar Co., Ardmore, Pa., before becoming associated with SKF. He has served with Wright Aeronautical Corp. and Buick division of General Motors Corp, and is a member of the Society of Automotive Engineers, the American Society for Metals and the Army Ordnance Association.

USS to Operate Worldwide In 29 Ports

In a move designed to operate world-wide services for American seamen at the most effective peacetime level, the United Seamen's Service announced a program under which their facilities for seamen will be maintained in 19 overseas and 10 domestic ports.

USS has provided American seamen with housing, recreation and personal service since its inception in 1942. Organized at a time when American ships were carrying war cargoes across hazardous shipping lanes, the decision to continue USS as a peacetime agency was made in September, 1946.

Marshall E. Dimock, chairman of the USS's executive committee and professor of public administration at Northwestern University, said that the new pattern of USS operations has been drafted by a sub-committee of the executive committee after careful study and consideration of the preferences of seamen, shipping industry executives, union leadership, government and the public, all of which are represented in the USS organization.

Bethlehem Vet Shipbuilder Retires

Francis E. McCormick, 69, assistant to the manager of sales and oldest employee in terms of service at Bethlehem Steel Company's San Francisco Yard, retired January 1 after 51 years at the yard. He lives at 115 Pacheco Street, San Francisco.

Mr. McCormick came to work for the Union Iron Works (now Bethlehem), as a machinist apprentice in 1895 when the Yard was completing the famous battleship, Oregon. He recalls working on that vessel's machinery.

In 1905 he was transferred to the estimating department, and in 1912 was appointed chief estimator. He remained in this position until 1944 when he took over the position of assistant to manager of sales.

Arthur McCutchen, senior research engineer of the Products Engineering and Research Department of Tube Turns, Inc., Louisville, Ky.

WESTINGHOUSE ELECTRIC CORP.'S new booklet gives maintenance hints for general purpose turbines. The booklet first describes the steam turbine, explains how it operates, and tells how it should be installed. Directions for piping, joint sealing and lubricating are given.

Francis E. McCormick

M. V. Gadsden loading locomotives for shipment to France.

Another
BETHLEHEM CONVERSION *FIRST*

Built as a C1-M-AV1, the *M. V. Gadsden* served as an assault cargo ship (AKA) during the war and was turned over by American Eastern Corporation to Bethlehem's Baltimore Yard for conversion into a locomotive carrier.

With its extensive facilities, alert organization, and conversion "know how," Bethlehem was able to handle this complex job efficiently and economically.

The conversion necessitated virtual rebuilding of the 338-ft vessel in order to give her the structural strength and to provide the equipment required to handle eighteen locomotives and their tenders at a single lading. In addition, the *Gadsden* was fitted with huge winches, booms and cranes to enable her to lift a 125-ton engine without shore aid.

Now aiding in the rehabilitation of the French railway system, the *Gadsden* has the distinction of being the first vessel of her type ever converted to a locomotive carrier—and another Bethlehem Conversion *First*.

SHIPBUILDING . . . SHIP CONVERSIONS . . . SHIP REPAIRS
NAVAL ARCHITECTS and MARINE ENGINEERS

BETHLEHEM STEEL COMPANY
Shipbuilding Division

GENERAL OFFICES: 25 BROADWAY, NEW YORK CITY

SHIPBUILDING YARDS

- QUINCY YARD
  - Quincy, Mass.
- STATEN ISLAND YARD
  - Staten Island, N. Y.
- BETHLEHEM-SPARROWS POINT SHIPYARD, INC.
  - Sparrows Point, Md.
- SAN FRANCISCO YARD
  - San Francisco, Calif.
- BETHLEHEM-ALAMEDA SHIPYARD, INC.
  - Alameda, Calif.
- SAN PEDRO YARD
  - Terminal Island, San Pedro, Calif.

SHIP REPAIR YARDS

- BOSTON HARBOR
  - Atlantic Yard
  - Simpson Yard
- NEW YORK HARBOR
  - Brooklyn 27th Street Yard
  - Brooklyn 56th Street Yard
  - Hoboken Yard
  - Staten Island Yard
- BALTIMORE HARBOR
  - Baltimore Yard
- SAN FRANCISCO HARBOR
  - San Francisco Yard
  - Alameda Yard
- SAN PEDRO HARBOR (Port of Los Angeles)
  - San Pedro Yard

Pacific Marine Review

NEWS FLASHES

KAISER SOLE BIDDER FOR RICHMOND YARD 3.

The sole bidder for Richmond Shipyard No. 3 when the Maritime Commission for the second time offered the yard to bidders on February 28 was Henry J. Kaiser. The yard at Richmond, Calif., is one of the few yards in the country having graving docks capable of drydocking large vessels, and is one of four being held in the National Defense Reserve for the Government. An earlier invitation, setting forth a minimum of $75,000 per month, brought no response.

In his bid Kaiser proposed to lease the plant for 10 years on a sliding scale of rental. Throughout the term of the lease, he would assume operation and maintenance costs of $350,000 a year. That would be his only payment during the first year. To that he would add $100,000 the second year, $200,000 the third, and $250,000 the fourth, and $250,000 a year thereafter.

His Washington representative said he intends to use the yard primarily for shipbuilding and repair, though his offer included use of the facilities for any purpose which does not impair shipbuilding.

Under terms he proposed he would have the right to cancel the lease at the end of each year, up to the third.

The Commission is not committed to acceptance of his bid.

* * * * *

CASTLE WILL SPEND $300,000 ON EASTBAY PLANT ADDITION

A. M. Castle & Co., steel jobbers, announce plans for construction of a new $300,000 warehouse and office building at 5th and Potter streets, Berkeley.

George Boole, general manager of the Castle San Francisco and Eastbay plants, said the new plant would be equipped with the most modern machinery for cutting steel. The new Eastbay buildings will have a floor space of 75,000 square feet.

* * * * *

CONTRACTS LET FOR BIG OIL PIPELINE IN ARABIA

Trans-Arabian Pipe Line Company confirm that orders have been placed with Consolidated Steel Company of Los Angeles for 980 miles of pipe and with National Tube Company of Pittsburgh, Pa., for 70 miles of pipe to be used in constructing the Trans-Arabian pipe line.

Contracts have also been awarded Chicago Bridge and Iron Company for erecting 14 tanks, and Graver Tank & Manufacturing Company of East Chicago, Ind., for erecting 22 tanks of an aggregate total capacity of 5,700,000 barrels.

Contract was awarded to Bechtel Brothers of San Francisco and associates, including H. C. Price Company of Bartlesville, Okla., for constructing about 600 miles main line and four pump stations at eastern end.

Williams Brothers Corporation of Tulsa awarded contract for constructing approximately 450 miles of main line at western and and also Mediterranean tanker loading terminal. Graver was also awarded contract for constructing two intermediate pump stations at western end.

(Arabian oil reserves are variously estimated at from five to twenty billion barrels, the higher figure being approximately equal to present known reserves of the United States.

(Trans-Arabian Pipe Line Co. is owned by Standard Oil of California and Texas Co. Present production is about 200,000 barrels daily.)

* * * * *

PRIVATE FIRMS TO TAKE OVER SHIPPING OF NAVY FUEL

The Navy is getting out of the petroleum business at some Pacific bases, and turning the reins over to private companies, Washington advices say.

Aviation gasoline and other petroleum products will soon be supplied by private oil concerns on Wake, Midway, Canton, Guam and Palmyra.

Tentative plans worked out call for the Navy to turn over all necessary facilities to the CAA which would lease them to Standard of California, Standard-Vacuum, Union Oil Co. of California and Shell Asiatic. Companies would operate facilities jointly but each will do its own marketing.

* * * * *

BASALT ROCK CO. HIGH BIDDER FOR LIBERTY SHIP

The Basalt Rock Company, Napa, Calif., was the high bidder for the Liberty Ship Benjamin Ide Wheeler.

The Napa company bid $25,800 under Condition One, that the vessel be scrapped, and $25,800 under Condition Two that the hull be scrapped and the machinery may be salvaged.

Other bidders: M. J. Ryan, San Francisco, Condition One, $19,128; Condition Two, $22,128; Walter W. Johnson Co., San Francisco, Condition One, $10,500, Condition Two, $13,500; National Metal and Steel Corp., Terminal Island, Calif., Condition One, $12,500, Condition Two, $21,178.

* * * * *

THE BABCOCK & WILCOX COMPANY ANNOUNCES A TWO-YEAR, $1,500,000 MANUFACTURING REPLACEMENT PROGRAM FOR ITS BARBERTON, O., PLANT

BARBERTON, O., Feb. 13.--Announcement of a two-year, $1,500,000 program for machinery replacement and improvement of its Barberton plant is made by The Babcock & Wilcox Company. The money for this project, which will include all shops, has already been allocated. In addition to the new equipment to be installed, production will be facilitated by the relocation of machinery and rearrangement of certain shops in order to minimize the handling both of raw materials and the products manufactured.

All types of shop equipment and machine tools will be purchased. The expenditures are made not only to increase plant capacity, but to maintain and improve quality of products.

* * * * *

ALTERNATE C-3 FEATURES

The United States Maritime Commission announces that it will permit a choice of certain features of its modernized C3 cargo vessel to suit the individual requirements of prospective purchasers and minimize the cost of construction.

Separate quotations will be accepted from bidders on six features of the new C3-S-DB3 design which may be desirable for some trades but not necessary in others, the Commission said. Any or all of these features may be specified, to be added to the cost of the vessel. They are

1. Cargo refrigeration (60,000 feet will be proposed).
2. Cargo dehumidification (the tentative proposal is for holds 2, 3, 4 and 5).

3. Cargo oil deep tanks (proposal is to utilize hold No. 4 with independent pumping arrangements and heating coils).
4. Power topping lifts to facilitate setting up and handling the booms, thereby minimizing stevedoring and other labor time.
5. Gyro-pilot, which is proved desirable but left to the option of the purchaser as to necessity.
6. Combustion control (same comment as item 5).

The Commission feels that to allow these options will make the new design more attractive to purchasers, considering the advantages and improvements over the original C3 type, especially as to facilitating cargo stowage by the use of twin hatches, possibilities of increased deadweight, and improved cargo gear design.

Early applications for purchase are expected by the Commission, and since construction funds are limited, the first applicants will probably receive the allocation of such vessels as may be built within the funds available.

* * * * *

FIBERGLASS TO BUILD PLANT IN CALIFORNIA

Plans to construct a plant in Santa Clara county, Calif., that will eventually hire 1000 workers with a total payroll of $1,500,000 have been annnounced by the Owens Corning Fiberglass Corporation of Toledo, Ohio.

The plant will be built on a 42-acre site that has been purchased in the Pasetta industrial tract, about 40 miles from San Francisco.

Present plans call for the plant to produce building insulation and other Fiberglass products in sufficient quantities to meet the needs of West Coast contractors and builders.

The corporation is presently operating four manufacturing plants in the East and Midwest.

* * * * *

"ATOMIC AGE" NAVY

The first two ships of the "atomic age" Navy were given the green light by a subcomittee of the House Armed Forces Committee, which recommended that $30,000,000 be made available for construction of two submarines grossing 4000 displacement tons.

Facts revealed before the committee by Vice Admiral Earle W. Mills, chief of the Bureau of Ships, and Vice Admiral Robert B. Carney, Deputy Chief of Naval Operations for Logistics, raised the inference that the United States had been forced into a submarine development race with Russia, as a result of a three-power division of German war spoils.

* * * * *

LARGEST LIQUID CARGO BARGE TO BE BUILT BY BETHLEHEM

Bethlehem Steel Company's Staten Island Yard has been awarded a contract for construction of one of the largest non-propelled liquid-cargo barges ever built.

To be constructed for the National Lead Company, the barge will be an all-welded steel craft 246 feet long, with a beam of 43 feet and depth of 20 feet 9 inches. Of 3,925 tons displacement, it will carry approximately 2,900 tons of liquid cargo--believed to be the largest capacity for any craft of this type.

The firm of Kindlund & Drake, naval architects, prepared the basic design for the barge, which is scheduled to be completed about August 1, 1947. The craft will be of the conventional raked-end type but will incorporate advanced methods of longitudinal and transverse framing and other improvements.

Navy's Contribution to Anti-Fouling

IN THE MARCH 1946 ISSUE of Pacific Marine Review, there was published a paper on anti-fouling paints which had been presented at a meeting of the Northern California Section, Society of Naval Architects and Marine Engineers. A. E. Burns, Jr., who read that paper, was awarded the Distinguished Service Medal for his research work at Mare Island and in making the award, Secretary of the Navy Forrestal stated, "This research has been of outstanding value in improving the effectiveness of the naval forces of the United States. Through it, our ships have been enabled to cruise farther on less fuel, to keep at sea longer between dockings, and to maintain higher speeds after lengthy periods out of dock."

The Jap navy defeated and the war won, Burns left Mare Island and turned to developing practical methods of putting his marine chemical knowledge to work for commercial and private vessels. With the endorsement and backing of L. A. Hart, wealthy young Texas businessman, Burns founded the firm of Hart and Burns, Inc., and established his own research laboratory at Riverside, California. The result of this organization is the production and distribution of a new family of protective coatings, the heavy marine line under the name of "Durahart" and the yacht line under the name "Navicote." This complete line of finishes now provides *all* ships with the identical fouling-immunity which enabled our Navy to keep its ships waterborne for years, and also provides new efficiency and beauty in all phases of marine surface protection.

The Story of Soluble Matrix, Known as S. M.

After crippling our fleet at Pearl Harbor the Japs must have felt certain we could not challenge their naval power in the Pacific for years. However, by keeping the remainder of our out-numbered warships in almost continuous action the Navy was able to check the Japanese thrusts at Midway and Australia, and as our new fleet came into being, to make the Pacific an American lake.

What the Japs did not know was that the U. S. Navy had developed a new type of anti-fouling paint which gave protection against marine growth for two years and more. As a result, fouling seldom restricted or impaired the operations or efficiency of the U. S. Fleet although its vessels remained for months at a time in the most prolific fouling waters of the world thousands of miles from drydock facilities. The Jap warships, on the other hand, frequently became heavily fouled and had to be withdrawn from action and drydocked at relatively short intervals.

The secret of the Navy anti-fouling paint is "S. M.", an abbreviation for Soluble Matrix. Soluble Matrix means that release of the copper toxic is controlled at a steady, uniform rate by the slow solution of the specially designed matrix Navicote Copper. S. M. affords protection against barnacles, bydroids, worm-tubes, molluscs, algae, teredos and other fouling growths for at least two years in either tropical or temperate waters. S. M. is an important development in the anti-fouling paint field and has contributed to some solution of the marine fouling problem which has plagued seagoing vessels from time immemorial.

The Army's Ship Conversion Program

(*Continued from page* 64)

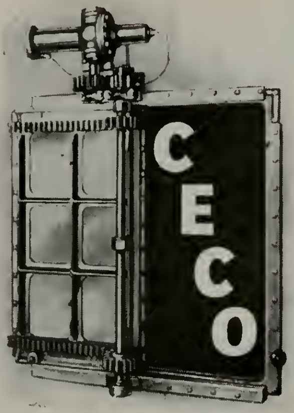
the war. These vessels were transferred to the War Department in the fall of 1946 and in December were placed in conversion yards within the Seattle area. When completed these vessels will be the first fully converted Army transports in postwar service. The vessels will have troop quarters for 495 men with messrooms, complete hospital facilities, recreation spaces, post exchange and other features to add to the comfort of the postwar Army enlisted man.

Cabin accommodations for 199 passengers have been provided, all rooms being fitted with built-in furniture and tastefully decorated. Dining saloons, lounges, and smoking rooms are being outfitted to insure all passengers the same high standard of accommodations as are found on commercial passenger vessels.

The entire conversion, repairs, and incidental work are being completed to the highest standards of the Coast Guard and American Bureau of Shipping and the vessels are being fitted with a full complement of life saving gear, fire detecting and extinguishing systems, remote control watertight door systems and all other features, which are required to insure safety of passengers and crew.

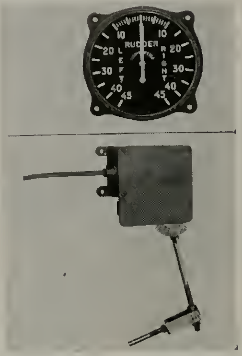
The planning for this extensive program is handled in the Office of the Chief of Transportation in Washington, D. C., and all necessary plans and specifications emanate from that office. Negotiations leading to the awards of contracts to various ship repairers are carried on by the staff of the Chief of Transportation and competitive bidding is the basis for all such negotiations. The actual work of contracting for conversions and inspecting vessels undergoing conversion, together with preparation of detailed repair specifications for each vessel, is handled by the competent staffs at the Ports of Embarkation, located at San Francisco, New York and Seattle.

All personnel involved have worked assiduously on the development of this War Department master conversion plan and it is due to their unremitting efforts and to the assistance and cooperation rendered by the various ship repairers involved that a rapid fulfillment of the program is being achieved.



Keep Posted

New Equipment and Literature for Yard, Ship and Dock



New Liquidometer simplified Electric Rudder Angle Indicator

The pleasure-boat type indicator (top) is equipped with luminous pointer and graduations. The pointer, which is supported by jewel bearings responds to slight changes of the rudder's position. The transmitter (bottom) is so constructed that it can operate under water. The instrument's accuracy is not affected by voltage drop so that the indicator can be mounted at any position aboard ship and a number of indicators can be actuated by one transmitter. Another model electric indicator is available for large workboats or seagoing ships.

Liquidometer to Ets-Hokin & Galvan

"How much fuel and water do I have left?" is a question almost as old as shipping itself, and *Ets-Hokin & Galvan* have recently taken two steps to answer it for California shipowners.

First, they announce their appointment as California distributors for the *Liquidometer Corp.;* second, they announce the addition of *Joseph J. Janeseck* to their staff of marine experts. Janeseck was with the Liquometer Corp. for five years as general service manager and fifteen years as field engineer. This double change is in line with the Ets-Hokin & Galvan policy of being able to give expert engineering advice and service on all products sold.

Shipowners will be interested to know that every U. S. submarine built since 1924 has carried Liquidometer gauges; many surface vessels and aircraft have been similarly equipped. For workboats, tugs, and ships, Liquidometer builds four general types of gages; (1) direct reading at the tank; (2) electrically operated remote reading types; (3) air operated remote reading types; (4) the balanced hydraulic type which requires no outside power to operate. All types are easily installed by anyone familiar with basic tools.

Ets-Hokin & Galvan will also handle other Liquidometer products, such as rudder angle indicators and position indicators. The latter instrument gives a remote reading of the position of valves or levers anywhere on the ship.

Aluminum Accommodation Ladders

The Aluminum Ladder Company, Worthington, Pa., announces a new line of accommodation ladders for the marine industry. These new light-weight aluminum ladders, mounted on both port and starboard sides, are designed to supplement the company's line of aluminum gangways for discharging and loading passengers.

The accompanying illustration shows a 36 ft. aluminum accommodation ladder mounted on the side of a Grace Line ship. It is made from 61 ST Aluminum Alloy, having a tensile strength of 45,000 psi. The ladder is raised and lowered by means of a block and tackle. When not in use, it is raised to a horizontal position and is securely mounted to the side of the ship.

Aluminum accommodation ladders are made to buyer's specifications. The manufacturer will furnish complete information on request.

B & W Boilers For Heavy Cruiser

The U. S. Navy's heavy cruiser, the USS Rochester, built by the shipbuilding division of Bethlehem Steel Company, Quincy, Mass., and which was commissioned December 20, has been equipped with Babcock & Wilcox boilers.

The Rochester is one of three 13,700 ton heavy cruisers of the war program. Its near sister ships are the USS Oregon City and Albany. Like other cruisers of the Oregon City class to which it belongs, the Rochester carries nine 8 inch 55's (heavy) and twelve 5 inch 38's.

The boilers installed in the USS Rochester are of the single-uptake divided furnace, controlled-superheat type. Accurate contol of steam temperature at all operating capacities is obtained in this type of boiler by adjusting the quantity of oil burned in the two furnaces.

Any desired degree of superheat, up to the designated temperature, can be furnished, and saturated and superheated steam can be obtained simultaneously at any operating condition.

This type of boiler permits safe operation with high temperature, because the steam temperature can be decreased, if necessary, when the vessel is maneuvering or backing. The possibility of temperature shock to the turbine, steam pipe and flanges is thereby reduced; resulting in minimum maintenance costs. These boilers are similar in design to the many boilers which were built during the war by the Babcock & Wilcox Company for U. S. combat vessels.

Constructed at the company's plant at Barberton, Ohio, the boilers are equipped with B & W stud type economizers, convection type superheaters, and B & W Iowa design oil burners.

Mackay's Marine Coastal Radiotelegraph Stations

The Marine Division of the Mackay Radio and Telegraph Company announced plans for the construction of three new powerful coastal radiotelegraph stations as part of an expansion program designed to offer the maximum in communication services and safety measures to ships at sea. The new stations, for which authorizations have just been issued by the Federal Communications Commission, will be located in the Gulf and Pacific Coast areas. Mackay Radio is an operating affiliate of the American Cable & Radio Corporation.

Containing the latest in communications and electronic equipment, the new stations will be located at Kent, Washington (near Seattle), Galveston, Texas, and at Kailua in the Hawaiian Islands. Mackay Radio, according to E. H. Price, vice president and general manager of the Marine Division, also expects to establish similar facilities in Manila, in the Philippines, in the near future.

Mackay Radio's expansion program, according to the announcement, is in line with the company's policy of offering reliable communications and safety services to the many hundreds of ships that were equipped with the "all - in - one" Mackay Marine radio unit during the war. The "all-in-one" shipboard radio room unit was pioneered by the company and resulted in the savings of many thousands of man hours in installation time in shipyards.

Mackay Radio already has high-powered coastal stations in operation at Thomaston, Maine; Amagansett, Long Island; New York City; Jupiter (West Palm Beach), Florida; Los Angeles; San Francisco, and Portland. Oregon.

New self-locking device for hooks designed by W. H. Foster of Los Angeles.

Self-Locking Device For Hooks

A simple self-locking device that may be adapted to hooks used in hundreds of industries has been announced by W. H. Foster of Los Angeles, who holds the patent rights. This self-locking hook has a fulcrumed latch finger that closes the opening into the hook—and is retained in this closed position, so that it can not be accidentally swung inward, (thus opening the hook) as result of the latching finger being struck on the outside. For swinging the latching finger into open position, a manually operated spring-held member is manipulated. A portion of this manually-operable member engages a part of the latching finger at a point a substantial distance away from its fulcrum, so as to effectively maintain the latching finger in position to close and lock the hook.

An effective use for this device is in the mooring of boats, making a positive yet readily releasable connection between cables used in hoisting equipment, and in connection with the safety belts utilized by firemen or by workmen engaged in the erection of pole or tower supported electrical equipment and the like. Also for logging, hoists, cranes, towing couplings, well drilling, marine elevators, aviation equipment and cable lines, or it can be adapted to baggage hooks, belt hooks, harness hooks, or window washer hooks.

Aluminum Conveyor Cuts Work on Docks

Aluminum has been called in to help unload ships along New York's waterfronts. Two portable conveyor units, made entirely of aluminum with the exception of the motor and conveyor belts, were put into service by the Brooklyn Waterfront Terminal Corp.

The conveyor work is merely the first of new duties which aluminum is expected to take up along the waterfront. Shippers and warehouse men are now experimenting with aluminum chutes which would be used to transfer commodities from warehouses to trucks.

Weighing less than half that of similar steel assemblies, which heretofore have served ships and warehouses, the aluminum conveyors can be moved without difficulty from job to job by two men. The predecessor steel units required the services of four men when they were switched from one job to another.

The new units were manufactured by Carsten & Iversen of Brooklyn according to plans of that company's engineers and those of Aluminum Company of America. One is 20 feet long and the other is 30 feet. They are powered by one and one-half and two hp motors and carry bags of commodities weighing 200 to 250 pounds each. Because of aluminum's resistance to weather conditions, the new units will require less repair work.

Texaco's New Line of Oils For Marine Inboard Engines

Development of a complete new line of marine lubricants, designed to improve the performance of pleasure craft inboard engines, both gasoline and diesel, at reduced operating and maintenance costs, is announced by The Texas Company. Known as Texaco marine motor oils SAE 10, 20, 30, 40, and 50, these five new products are heavy-duty detergent type lubricants — mineral oils with additive compounds completely soluble in the oil which keep engines clean by preventing undesired deposits and protect against corrosion of alloy type bearings. They prevent rusting of the lubricated surfaces, and reduce wear on cylinders and rings, which is of great benefit during break-in periods of new engines or run-in operations after repair.

These new oils are manufactured by careful refining from selected crude sources. The additive compound is then incorporated, providing several important characteristics not obtained in straight mineral oils alone. The result is a lubricant which keeps new engines clean and provides a cleansing or dissolving action which reduces or removes previously formed deposits from used engines. In addition to this cleansing action, the chemicals keep the finely divided particles resulting from fuel combustion and oil decomposition suspended in the oil so that they do not settle out in the engine but are removed at regular oil-change periods.

By promoting engine cleanliness, the new oils eliminate sticking of piston rings which causes scored cylinders or liners and wear on cylinders and rings. Maximum power output is attained with savings in fuel and lubricant consumption as well as the expense of frequent overhauling.

The new oils meet the lubrication requirements of all gasoline inboard engines, from the small sizes with two or four cylinders to large engines of several hundred horsepower. In addition they meet the demands of all high-speed diesel engines in pleasure craft and many lower speed diesels having a single lubricating system.

Trylon Drum Sling Facilitates Handling

A further development of their Trylon safety sling kits for all light weight lifting has recently been introduced by the Wire and Cable Division of the Wind Turbine Company, West Chester, Pa. Specifically designed for the hoisting of drum type containers, the Trylon safety drum sling makes possible the handling of heavy drums, barrels, kegs, chemical and oil containers, large cans, and similar items with both safety and ease. Heavy clips mounted on a rod with an adjustable pressure spring at each end grip the container securely until it is deliberately released. The spacing of these clips can be quickly altered and put in place to fit any size barrel, drum or keg. The sling is equipped with 5/16" plow steel wire rope and has a minimum breaking strength of 8,000 pounds. The entire assembly is hot dip galvanized to prevent rust. Literature describing this new Trylon safety drum sling will gladly be sent on request.

Diesel Book Available

The Detroit Diesel Engine Division of General Motors has prepared a fine explanatory book, pictured above, on diesels for every power requirement. The book was introduced at the recent New York Motor Boat Show and was in great demand. Copies may be requested from Detroit Diesel distributors or through the Pacific Marine Review.

Hot Off The Press

PAINT, PUTTY AND ELBOW GREASE, is the title of a handy, useful and informative booklet put out by International Paint Company, and written by a "Guy Who Should Know Better," the Sunday sailor. The author gives the yachtsman and amateur a thorough briefing on the procedure of spring painting and commissioning of pleasure craft and of its upkeep during the season.

* * *

ELECTRONIC CONTROL is the title of bulletin No. 5 issued by the Wheelco Instrument Company, Chicago, Ill., on automatic temperature control systems. By means of charts, tables and diagrams, the measurement and automatic control and the selection of proper control systems for process applications are explained. Thermocouples, their placement, and hints governing their use, and the selection of protecting tubes are treated separately. The condensed presentation on this subject makes the Wheelco Educational Bulletin No. 5 a valuable guide for anyone interested in process instrumentation.

* * *

LESLIE CO. issues a new Bulletin on Temperature Regulators and Controllers, Bulletin No. 464 covering the engineering, operating and maintenance data. Included also are sizing and capacity tables to guide the selection of the proper regulator or controller for specific applications. Instructions for installing, operating, dismantling, cleaning and assembling are presented in an easily-followed sequence.

"CONTINUOUS BLOWOFF FOR BOILER PLANTS" (Reprint 45), a two-part article has been reprinted by Cochrane Corporation, Philadelphia, Pa., for those interested in the saving possible with heat recovery from boiler blowoff waters.

* * *

POWER TRUCK 1947 MODELS: Elwell-Parker Electric Co., Cleveland, has issued a new catalog illustrating 31 models including low-lift, with and without crane units; high-lift platform trucks; fork-type; cranes; stationary-bed load carriers and tractors. They are available with either electric or gas-electric power. The complete line provides engineered equipment for practically every materials-handling job within the field of industrial trucks and cranes.

* * *

NEW RADIOMARINE RADAR BROCHURE: A new 12 page de luxe two-color brochure describing in detail their model CR-101 shipboard radar designed for commercial ships and large pleasure craft has just been published by Radiomarine Corporation of America. The pamphlet is profusely illustrated with views of the equipment, samples of actual Radiomarine radar scope pictures taken at sea under operating conditions, views of the ore-carrier A. H. Ferbert installation, and detailed specifications and dimensions of the equipment.

* * *

Cunningham Air Whistle

The Cunningham Manufacturing Company has taken over the manufacturing and sales of the Cunningham line of diaphragm type air whistles and control equipment, including electric air units, manual and Solenoid type whistle valves, Coding timers and switches.

Fred M. Arntson, former superintendent of the Cunningham Steel Foundry, is manager of the Cunningham Manufacturing Co. Associated with him is Eugene Cunningham of the Cunningham Steel Foundry. C. D. Chaffee, formerly with Doran Co., is in charge of the office.

The plant of the Cunningham Manufacturing Co., is in Seattle at 4200 W. Manegnal Way.

Marine Close-Coupled Geared Turbine-Generators

New close-coupled, geared turbine-generators designed especially for compactness, power, and economy in marine auxiliary electric power systems have been added to the line of General Electric marine equipment. These new turbine-generators are available in 40-, 50-, and 60-kw sets, condensing or non-condensing, with inlet steam pressures up to 250 pounds and exhaust pressures up to 50 pounds. Close-coupled for compactness, these sets can be installed in limited space, or replace outmoded units with room to spare. These new sets comply with American Bureau of Shipping, U. S. Coast Guard Merchant Vessel Inspection, and A.I.E.E. Merchant Marine Section standards.

Steam control of the turbine is provided in a co-ordinated design of steam strainer, trip throttle valve, and governing valve. Close speed control is assured by an oil relay speed governor, which controls a powerful hydraulic cylinder acting directly on the governing valve stem. Safety features include an automatic overspeed-trip device and a generator trip switch to guard against accidental overspeeding of the unit. The governing and trip throttle valves control all the steam to the turbine, including the steam to the separate nozzle valve which is provided to insure full capacity at low steam pressure.

Designed with features to meet the requirements of shipboard use, the enclosure is drip-proof, with ventilating openings screened and large cover plates which can be easily removed for commutator inspection. Insulation on the armature and field windings is given special treatment to withstand salinity and moisture. Brush-holder hardware is provided of corrosion-resistant material. Radial-blade fan ventilation coupled with steel frame construction and cast iron end shields assure strength, protection, and durability.

Lubrication of the reduction gear is maintained by a self-contained oiling system, which also furnishes oil to the governing system. The turbine is securely attached to the gear case. The gear and generator are assembled on a steel base to simplify installation and maintenance of alignment in service. Tapping and drilling for cable connections is facilitated by the oversized, marine-type, cast iron connection box.

Obituary

We have just learned that a very fine old seaman and one of the oldest Pacific coastwise skippers, Captain Gust. Johnson, passed away in San Pedro, November 26th, last, at the ripe age of 82. Captain Johnson was for many years, and up to the time of his death, a subscriber to this magazine.

Born in Sweden, he came to the Pacific Coast in his 17th year and soon worked up to his Captain's license. He was master of many of the old steam schooners including Rival, Grace Dollar, and Melville Dollar in the Robert Dollar Lumber Company fleet, and later was with Vail and Vicker at San Pedro.

In addition to his widow he leaves three sons, two daughters and five grandchildren.

New Marine Radio Equipment

The Ranger Model 118 Portable, an unusual triple-purpose ac/dc marine receiver that recharges its own dry batteries, is now ready for delivery by Electronic Specialty Company, Los Angeles. The Ranger Portable receives on both broadcast (540 to 1550 kc) and long-wave (195 to 410 kc) bands, including marine radio-beacon frequencies. In addition, it is an accurate marine direction finder, with a built-in balanced low-impedance loop that enables bearings to be taken with approximately two degrees accuracy.

New Ranger portable radio receiver and marine direction-finding unit.

Total weight, with batteries, is only 7 pounds, 8 ounces. Over-all dimensions are: 10⅝ inches wide by 7 inches high by 6 inches deep. The entire set is precision built, with a high-performance superheterodyne circuit of excellent sensitivity and selectivity, and an attractive exterior of etched aluminum and Dupont plasticized fabric.

Cut me out and send me in

PRODUCT________________ Page No.________

PACIFIC
MARINE REVIEW

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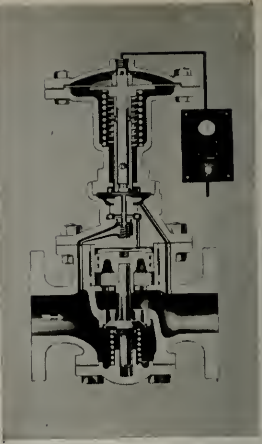

LT-3 reducing valve, remotely adjusted and type ARP control panel.

New Remotely Adjusted Regulating Valve

A new single-seated, internal pilot, piston operated reducing valve designed to be remotely adjusted from a conveniently located air loading panel, has been announced by Leslie Co., Lyndhurst, N. J., makers of regulators, controllers, strainers and whistles.

The air loading panel includes a small ⅛″ combination pressure reducing and relief valve (no continuous leak-off) mounted on a panel containing an adjusting knob and a large, easily read air pressure gage. In operation, the reducing valve is adjusted to the desired pressure setting by air pressure supplied by the air loading panel.

Furnished in high pressure bronze or cast steel body with flanged or screwed ends, these valves have completely interchangeable replacement parts, stellited seat rings, and hardened stainless steel 800 Brinell main valves as standard equipment.

Manila Rope Now Available In All Sizes

According to a recent announcement by Tubbs Cordage Company, pioneer rope manufacturers, new regulations were released January 16, 1947, by the Civilian Production Administration affecting the manufacture of both Sisal and Manila rope.

The Corsair Conversion

(Continued from page 54)

staterooms. On this deck forward, and adjacent to crew quarters are located: the ship's laundry; the petty officers' mess; and the crews' mess.

All of the passengers rooms will be decorated and furnished elaborately and luxuriously. Beds are all equipped with Simmons spring-filled beauty-rest mattresses. Sofa beds are the famous Arnot sleepers, which are handsome and comfortable davenports by day and luxurious beds by night. Interior decoration is being supervised by Wm. F. Schorn of New York, whose work on other large conversions has attracted favorable attention.

Air conditioning of all public rooms and passenger staterooms has been adequately provided in the plans and sufficient refrigeration capacity is being added to properly carry this additional load. The conversion job will run above a million dollars in cost.

One of the main attractions in the type of cruises contemplated is good food. Pacific Cruise Lines, Ltd. has already engaged as chief steward for this vessel, a man who for many years on the Atlantic coast has been catering with great success to the same type of cruising clientele that will be attracted to the Corsair cruises. Under special orders, the architects provided for the chief steward an office-stateroom of spacious proportions which is as beautifully decorated and furnished as those of the captain and the chief mate.

In the Corsair, the passengers will have the luxury and somewhat of the privacy of the finest yacht on a vessel of sufficient size and power to give adequate sea comfort and safety.

The Economical Maintenance of Turbine Geared Prime Movers

(Continued from page 59)

grained with abrasive matter or even worn out of shape by misalignment. In such cases rebabbitting will be necessary.

Turbine or gear bearings cannot have joints stripped to reduce clearance. They are bored concentric and must remain so. Complete information for rebabbitting and remachining is usually given in the instruction books.

If it becomes necessary to balance turbine or gear rotors, without benefit of supervision by the builders representative, it must be clearly understood that the welding on of weight or drilling into wheels to remove weights is a dangerous procedure and should be strictly forbidden. In fact, rotors so treated are likely to be condemned. Some rotors have balance weight grooves, some have balance collars with tapped holes to receive weight, but others have no provision for installing weight and it is necessary to trim the wheel by grinding the face of the rim, on the radius directly under the bucket dovetail. The exact location is clearly marked during manufacture.

The standing objection to welding rotors, or any other machined part for that matter, is the certainty of distortion by local heating and the certainty of imposing internal strains that can be extremely dangerous.

Drilling into turbine wheels has been practiced in the past, but only on slow rotors and especially on wheels with an extremely heavy cross section. High speed rotor wheels cannot have an appreciable amount of weight drilled from the disks without dangerously weakening them. We have a record of a few cases where unauthorized persons have drilled into high speed turbine wheels and we have been forced to recommend that the wheel or entire rotor, if it be a solid rotor, be condemned.

Reduction Gearing

When gear teeth are inspected by the owner's personnel any sign of distress or poor tooth contact should be immediately reported to the manufacturers representatives. It is not good practice to expect gears to "wear in." In good practice ships start out with one hundred per cent contact on their gear teeth and if that contact decreases it is evident that a change in alignment has taken place. Bearings should be checked, as one worn bearing upsets the true alignment. Again distortion of the foundation may be the cause and either condition can be remedied without resorting to a major operation.

Gear Noise

Dead quiet reduction gears are more common today than they were in the past, but a moderate gear noise is the average condition, and not at all objectionable on commercial vessels. As a matter of fact, the best wearing sets that have come to our attention have been in the latter class. It should be understood that undue gear noise, objectionable as it is, may not be an indication of gear trouble. However, if a normally quiet gear set should become noisy, the matter should be called to the attention of the manufacturer's representative as such a condition may be a loud complaint, from the gears, that all is not well.

Reduction gears require oil in its purest form. Turbines thrive on dry clean steam and if both of these conditions are met maintenance is a pleasure.

An Insurance Analysis for the Shipper

(Continued from page 86)

lish word "Halvers"—meaning partners and "Halverage" —meaning partnership.

Another theory is that the word comes from the Greek "Avaros"—meaning "without charge" which the Greeks used when a ship having made a jettison arrived without its entire cargo.

A third theory and to me the one that means the most logical is that "average" is derived from the old Roman word "Aversio." "Aversio" was used in the Roman market place—"ex Aversione emere"—to mean "buy for a lump sum and assume all risks." This meaning had come into the market place from the waterfront where it had been used to designate the act at sea by which one party sacrificed his goods and assumed the risk of all the others, meaning he averted his sure loss by assuming the risk of others. If the others lost their goods, he would be unable to collect from them a contribution to his loss.

"Aversio" was lost as a sea term but continued on in the market place, and centuries later was used to designate what we call "insurance"—that is, the averting from the individual adventurer to the underwriters the consequences of the perils mentioned. This became "Particular Average" to distinguish it from the usual, or "General Average."

Today, one frequently hears "Average" explained as damage; "General Average" meaning damage to the interests in the adventure in general and "Particular Average" meaning damage to certain interests in the adventure in particular. This explanation of the term certainly does help the lay mind to grasp some of the significance of the term. To know that "average" has behind it the meaning "avert" is also a help; "General Average" meaning to avert a loss to the adventure in general and "Particular Average" meaning to avert a loss to an individual adventurer in particular.

When we try to explain the meaning of "General Average," we find that it is a very indefinite expression. First, it may refer to a "General Average act" which is any extraordinary sacrifice or expenditure which is voluntarily and reasonably made or incurred in time of peril for the purpose of preserving the property imperiled in the common adventure.

"General Average," may refer to the loss which is caused by or directly consequential on a General Average act. It may also refer to the General Average contribution. When one party suffers a general average loss, he is entitled to a rateable contribution from the other parties interested subject to the conditions imposed by Maritime Law.

I have dealt at some length with the meaning of the terms "Average" and "General Average" because the Carriage-of-Goods-by-Sea Act provides that "Nothing in this Act shall be held to prevent the insertion in a bill of lading of any lawful provision regarding General Average." It is safe to say that all bills of lading have provisions calling for contribution in general average. Therefore, if the vessel on which your goods are shipped should catch on fire and some cargo or the ship be damaged in efforts to put out the fire and your goods were saved by these efforts, you would be called upon to contribute to the loss caused by the putting out of the fire.

The shipowner can hold the cargo until the cargo owner posts security for payment of the general average contribution. The insurance company not only pays the contribution when the exact amount has been determined, but almost as important, it immediately issues its "guarantee." The shipowner will accept the guarantee as security for the payment of the contribution and immediately release the cargo.

The Bill of Lading

We have been comparing the exclusion of liability in the bill of lading with the assumption of liability in the insurance policy. It should be kept in mind, however, that the bill of lading governs only while the cargo is in the custody of the ocean carrier. There is a period of time prior to delivery of the goods to the ocean carrier and subsequent to delivery by the carrier on the dock at destination which we have not touched upon. The distribution of liability for loss during these two periods of time during which the goods may be in transit could be the subject of another article. It is also possible for the cargo owner to insure against some of the losses we have noted he must, so far, bear himself. This can be done through broader insuring conditions but that problem, too, is beyond the scope of this discussion.

Five Million Tons Salvaged

(Continued from page 71)

operations of the war. The Germans, described by the late Admiral Ramsay as "the best port demolishers in the world," did their utmost to deny the Allies the use of ports in North Africa, Sicily, Italy, the south of France and Northwest Europe. It is estimated that the vessels sunk or destroyed by the enemy will occupy the salvage resources of the Allied countries for nearly another ten years.

One of the most difficult jobs of the salvage department was carried out at Tripoli, where eleven ships of between 1,000 and 5,000 tons were sunk in a line across the entrance to the harbor, with a tangled mass of wrecked smaller craft and crane barges piled on top of them. It was impossible to get even a motor boat through.

Port Cleared In Five Days

First one of the block ships was demolished by skillfully placed explosive charges. Five days after the port's capture, landing craft were able to make the passage. On the eight day there was a passage 14 feet deep. On the fifteenth day a vessel of 15,000 tons passed safely through a passage which had been created by dragging the ships on either side of the central gap around on their keels like swing doors!

During the landings in North Africa, the British and American salvage forces joined hands and worked together. In the Bay of Naples they had to lift no less than 170 wrecks which were scattered all over the harbor. There were destroyers, tankers, tugs, corvettes, trawlers, floating cranes, tank barges, lighters, fishing vessels, all sunk in the fairway, with railway wagons and other debris piled on top of them.

Time and Motion Analysis For Material Handling

(Continued from page 83)

tively small time spent in travel with fewer larger loads at a higher speed. At this point it is well to consider that most material handling operations involve more than one movement of the same material through the plant or warehouse. For subsequent movements of our new pile, which is already on pallets, we have a parallel to the new and much talked of unit load of "ship on" pallet.

To make this comparison complete we should provide for the situation where goods are delivered on pallets. In this case, there is zero piling time. Therefore, our line theoretically starts at zero. The travel time will parallel that of the previous operation but 5 hours per thousand is deducted due to the fact that the goods are already piled.

In the preceding charts, we have shown a method which graphically represents under a certain set of conditions, the relative efficiency of several systems of material handling. Additional lines could be inserted in this chart to indicate other forms of material handling but it is difficult to conceive of any form of material handling squeezing between our line "F" and the base line.

Interocean Changes At Los Angeles

Interocean Steamship Corporation, through Walter Wilkinson, district manager, announces the following additions and changes to their staff: Phillips Seagrave has been appointed to the Los Angeles staff in charge of traffic. Robert Harding has been promoted to manager of the Intercoastal Department. Alvin Colflesh has joined the Los Angeles staff as chief clerk in charge of documents. Joseph Wickham is a recent addition to the San Pedro office under Robert Gaffney, manager of operations.

Ships Needed for Round-the-World

(*Continued from page* 52)

the sea traveller and an easy sale for the passenger agent. Plenty of natural fresh air and plenty of natural illumination combined with a room shape that is peculiarly adapted to modern decorative treatment.

Above on the navigation deck are rooms for the deck officers, a nice suite for the captain, a room and office for the 1st officer, a room for the following: 2nd, 3rd, and jr. 3rd officer, one room each; 4 cadets; chief, 2nd and 3rd radio operators, one room each; the radio room; the officers' lounge; the wheel house; the chart room; and the gyro room.

Public Rooms

The main dining room is a spacious apartment 44 feet fore and aft by 70 feet in the beam, with an offset 14′ by 40′ on the after bulkhead to house the stair landings, the elevator shaft and the entrance trunks to the galley. Doors to the galley are opened by electric eye. Those on the port side open only into the galley, those on the starboard side into the dining room. There is a clear deck area of 2500 square feet after deducting this offset. A room of this size and shape should lend itself very nicely to decorative treatment and with modern air conditioning and adequate illumination will make a very pleasant and appetizing eating place.

The galley serving this room and the room itself will be equipped with the most modern and most efficient machinery and apparatus for the preparation and serving of delicious meals. The galley has been planned after considerable research into the experience at sea with various galley plans and should be scientifically the most modern arrangement in any ship.

The lounge measures 24 feet fore and aft and 44 feet thwartship with clerestory running up through the boat deck. This clerestory is extended 10 feet forward over the thwartship passage to form a balcony on the boat deck level. Furnished as a passengers' writing room this balcony is reached from the boat deck stair and elevator landing and will make a very nice quiet spot for correspondence or other writing.

The smoking lounge is 44 feet thwartships and 40 feet in its longest fore and aft measurement. This room has 1440 square feet deck area in comparison with 1056 square feet for the lounge.

The proportions of these rooms are such that the interior decorators should be able to produce very beautiful effects. This is especially true in the clerestory of the lounge where there is an opportunity to make the appearance of spaciousness far exceed the dimensions.

Forward of the smoking lounge, and having access only therefrom, are a cocktail lounge and a card room, located starboard and port of the central passage joining the two lounges. This arrangement gives the steward's department a fine opportunity to cater to the divergent desires of passengers without disturbing those who want only quiet comfort. The conviviality of the smoking lounge and cocktail room need not disturb the quiet conversation, reading and music of the lounge.

The lounge is fully equipped for movies and the ship will have complete broadcast and public address systems. All passenger areas will be serviced by electric clocks controlled by a master clock located in the chartroom. All public rooms, and all passenger and crew staterooms and crew lounges and laundries and other inside rooms will be completely air conditioned.

The passenger sleeping apartments are all outside rooms with the exception of eight on the upper deck. Every passenger room is equipped with private toilet, wash basin and shower with running hot and cold fresh water. Every passenger bedroom is equipped with an automatic dial telephone for intra-ship communication and for connection through radio to shore or other similarly equipped ships.

The extent to which crew comfort has been planned is graphically evidenced by the fact that there are 72 bedrooms to serve a crew of 158 whereas only 71 bedrooms are provided to take care of a total capacity of 189 passengers.

A modern laundry is provided and equipped with all the latest machinery to take care of all passenger needs.

Safety

This design is stable and seaworthy in every respect and is a three compartment job. That is, three compartments must be flooded to sink the ship. Every precaution is considered in the equipment for detection of and extinguishing fire. Life preservers or life saving suits are provided for everyone aboard. Six life boats, one of them a powerful motorboat equipped to tow all the others are hung in gravity davits served by electric boat winches. The combined capacity of these boats will accommodate all persons aboard. Special hawse pipes will be fitted bow and stern for mooring to buoys. On the bridge all the most modern navigation equipment will be fitted including gyro compass, radio direction finder, radar, and loran.

Propulsion Machinery

This vessel is designed to be driven by a single screw and has a "contra-guide" form rudder post to transform some of the angular velocity of the water in the propellor stream into forward-motion energy for the hull. The propeller shaft is turned through double reduction gearing by a cross compound steam turbine designed to deliver 12,500 shp at 92 rpm of the propeller shaft when fed with steam of 600 psi gage and 840° F. total temperature at the throttle. The design will be such that the turbine will operate continuously when delivering 13,750 shp at about 95 rpm of the propeller shaft.

The main turbine will consist of one high pressure turbine and one low pressure turbine, each connected through a flexible coupling to a suitable pinion meshing into the first gear of the double reduction gear. An astern element capable of delivering 80 per cent of ahead torque at 50 per cent of the full speed ahead propeller revolutions.

To provide steam for this turbine and for other uses, two steam boilers will be installed in the engine room. These will be of the vertically fired, oil burning, two drum, water tube type and will be fired by steam atomizing wide range burners. An air preheater will be installed in the uptake of each boiler. Each of these boilers will have approximately 8100 square feet of water heating surface and at normal rating will generate 53,500 lbs. of steam per hour at 625 psi and 850° F. total temperature with feed water at 375° F. Each boiler will be

(*Please turn to page 130*)

S. F. Passenger Office of APL

Harry L. Baker, agent in charge of American President Lines' newly opened ultra-modern passenger office at 152 Geary Street, San Francisco, points out a feature of the unique illuminated wall map to E. Russell Lutz, the company's executive vice president. The new uptown offices, designed by Walter Dorwin Teague, are in keeping with the magnificent new luxury liners now building and projected for American President Lines' Oriental and Round-the-World services.

Ships Needed for Round-the-World

(*Continued from page* 128)

capable of sustained operation while generating 80,000 lbs. of steam at these same pressure and temperature conditions. At its normal rating the standard efficiency of each boiler will be at least 88 per cent.

Forced draft system of operation will be used with pneumatic type automatic combustion control. Stack velocities will be accelerated by additional air supply to soot remover controls.

Three 600 kw turbo-electric generators will be installed to take care of power requirements for electric deck machinery, engine room auxiliaries, refrigeration plants, ventilating fan motors, galley service, and ship's lighting. The main low pressure turbine will be mounted on an exhaust directly into the main condenser and the auxiliary turbines will exhaust into one auxiliary condenser. Condensate from both condensers will be pumped through the standard closed system of feed water heating, picking up heat from the inter- and after-condensers of the air ejector, the first stage heater, the gland drains, the second stage heater, and the deaerating heater which acts as an enclosed hot well providing a positive head on the feed pump, and so to the boiler drum.

Make-up feed for the boilers and potable and sanitary fresh water make-up supply are assured by two large distillers each of 30,000 gallons per day capacity.

It is anticipated that fuel consumption of this plant will be not more than 0.575 lbs. per shp hour for all purposes, based on oil of 18,500 btu per pound. This power plant at normal output is figured to give the ship an easy sea service speed of 19 knots. Her reserve power will enable her to make 20 knots or more whenever necessary.

Refrigeration

The cargo and ship stores, and air conditioning load on this vessel is quite considerable and careful planning has been used to minimize the load wherever possible consistent with reliability and good performance. All of the various galley and pantry refrigerators will be cooled from the central ship stores refrigeration unit. In ships stores boxes, ample provision has been made to carry large supplies of frozen foods.

The total refrigeration connected power load is 260 kw for cargo, ship stores and air conditioning. This may be compared to a total connected load of 870 kw when underway at sea. All the auxiliaries are electrically operated including: sanitary service pumps; fuel oil transfer pumps; circulating pumps; condensate pumps; main feed pumps; bilge pumps; fire pumps; cargo oil pumps; refrigeration machinery; ranges, coffee urns, broilers and bake ovens; laundry machinery; cargo winches; windlass and capstans; steering gear; ventilating fans; forced draft fans; and machine tools. The main switchboard in the engine room will distribute power for all these services to control boards covering certain blocks of motors.

Summary

A complete intermediate class cargo and passenger liner with a good turn of speed, this hull is proportioned to produce a sea-kindly vessel well calculated to deliver a comfortable and enjoyable sea voyage. Every care has been exercised to assure a healthy variety in the cuisine and to achieve artistic pleasing interior decorative effects.

With a fleet of such ships in operation on their Round-the-World Line, the American President Lines can offer American travellers all the amenities of life in a modern first class hotel plus all the thrill and interest of a voyage through temperate and tropic seas to the great ports of four continents.


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A
ALBINA
ENGINE AND MACHINE WORKS
LONGVIEW, WASH.
PORTLAND, OREGON

Admiralty Decisions

(Continued from page 89)

relationship to the operation of the vessel plying in navigable waters."

What can be said to have been the nature of the plaintiff's "service" and what was its "relationship to the operation of the vessel plying in navigable waters?" The court relies upon the *Aguilar* case as one approach to the solution of the problem because the Supreme Court, in holding the shipowner liable, pointed out that shore leave with its attendant relaxation is a necessary and beneficial antidote for the confinement and rigid discipline to which the seaman is subjected aboard a ship by reason of the unique nature of his employment. The court is of the opinion that, if for the purpose of determining the shipowner's liability for maintenance and cure, the seaman is said to be on the "shipowner's business" while on shore leave, then for the purpose of determining the shipowner's liability under the Jones Act, the seaman should be said to be "in the course of his employment" at the time. It is recognized, however, that liability for maintenance and cure does not necessarily result in liability under the Jones Act because liability under the Jones Act is predicated upon negligence whereas the liability for maintenance and cure is an incident of the seaman's contract of employment.

Nowery, the plaintiff, was a deck maintenance man aboard the ship and took his orders from the chief mate, not from Nantau, Chief Engineer. Courts in the past have held that where the injuries complained of were the result of an assualt, the employer is liable under the Jones Act when the assault was committed in the course of the discharge of assailant's duties and in furtherance of the work of the employer's business, even though the assault was in excess of the authority conferred by the employer upon the assailant. However, this rule is restricted by the fact that one must prove that the assault was committed by one having authority over the person assaulted and then only when committed in the course of the conduct of the master's business. In the instant case we have the head of one department assaulting a member of another department over whom he had no authority. Therefore, there was no basis in law for the court's first instruction to the jury that defendants were liable because Nantau, when he entered the barroom where the fight occurred, was acting "as an officer of the ship."

The second theory of liability, which is represented by the second jury instruction set forth above, might be sufficient upon which to base liability provided the court is willing to decree, as it apparantly has in this case, that liability would attach although the altercation and subsequent injury occurred ashore. In view of the fact that the jury may have held defendants liable on the basis of the first of the aforesaid instructions, the court was required to grant defendant's motion for a new trial so that the jury might be instructed upon the basis of the second instruction alone.

I disagree with the theories on which each of these cases was determined. At the present time the rule of law is broad enough to hold a shipowner liable for a seaman's injuries during authorized shore leave even though he travels ten, twenty, or one thousand miles from the vessel. The decisions have failed to place any limitation upon this rule of law and unfortunately the *Aguilar* decision has been blindly used as a standard for all of these cases. A careful review of the *Aguilar* decision will quickly reveal that it is limited to the particular facts before the court. It was not intended to be a standard for liability. There is another reason for my dissent and that is based upon the theory that you and I, who also may be regularly employed, are not given the same protection when we leave our place of employment. In other words, I see no reason for the distinction between seamen and John Doe where either the seaman or John Doe is on leave from his work during which time a shipowner and the shoreside employer respectively have no control over the activities or conduct of the seaman or John Doe.

From time to time I hope to be able to offer further decisions along the same lines that may at least ultimately limit the rule so that, if a seaman is to be protected while on shore leave, his protection will be defined and will not be permitted to cover an indefinite area as it now does under the existing decisions.

Quiz on the Ionization of Water

Question: *What is meant by the pH value of feed water?*

Answer: Water in its natural state, pure or impure, tends to ionization or electrolytic disassociation and a small part of all water will be found to break up according to the equation ($H_2O = H^+ + OH^-$). The H or hydrogen ion is positive, the OH or hydroxyl ion is negative.

At room temperature one liter (roughly it takes 4½ liters to make one gallon) of pure water will have one ten millionth of a gram of H ions and one ten millionth of a gram of OH units. In other words, 10,000,000 liters of pure water has one gram of hydrogen ions and one gram of hydroxyl ions.

These numbers are too cumbersome for ordinary formula so the logarithm is used. The pH value of water is the logarithm of the number of liters required to give one gram of H ions. For pure water at room temperature this would be the logarithm of 10000000 which is 7. So pH for pure water at ordinary temperature is 7. pOH for the same water would also be 7.

Since pH represents the reciprocal of Hydrogen ion concentrations, the larger the value of pH the less acid is the solution. In alkaline solutions there is a greater concentration of hydroxyl ions so that for such solutions pOH would be less than 7 and pH more than 7.

Long time experience has indicated that pH values of feed water should be maintained above 9.5 in order to minimize corrosion. This must be done by the controlled addition of the necessary chemicals. The alkalinity resulting from this treatment should be from 11 to 11.5 pH. It must be maintained and controlled very close to this range. A lower pH value would not maintain the film of ferrous hydroxide which prevents the dissolution of the steel. A higher pH value might cause caustic embrittlement of the steel or be detrimental to the steaming quality of the boiler.

War Techniques Used in New Shallow Draft Tankers

(Continued from page 92)

crew of 24, and their accommodations are arranged in well appointed quarters at the after end of the hull. When fully loaded, the F. C. Randall will average about 10½ knots, its tonnage being 554 net. Like most motor tankers of this type, its power plant and bridge are located aft.

Acquisition of the F. C. Randall has given Sinclair Oil a tanker of late design and capable of great flexibility, not only along the usual sea routes but also in close-to-shore operation. Because of its hull design, and a power plant that is highly adapted to its purpose, this specialized carrier of bulk petroleum now performs in peacetime pursuits the type of service made possible and perfected through wartime necessity.

The main propulsion equipment of the F. C. Randall is of the diesel engine direct reverse-reduction gear drive type and consists of one General Motors, eight-cylinder, two-cycle Model 8-278A diesel engine, directly connected to a special reduction gear by means of a pneumatically operated clutch and reversing mechanism. The clutch and reversing mechanism permits reversal of direction of rotation of the propeller while maintaining constant direction of rotation of the main engine. Complete control of propulsion power is afforded by means of controlling the engine speed and the inflation or deflation of the Airflex clutches from a hydraulic transmitter located on the engine and operating in conjunction with the governor control lever. The diesel engine and its direct-connected clutch-reverse-reduction gear unit are mounted on a common fabricated steel sub-base, with the engine start-stop and emergency throttle controls mounted on the engine.

The diesel engine is arranged for air starting, with starting air from air storage tanks, which likewise provide air for the air pressure reducing valve at the proper pressure required for the operation of the Airflex clutches. A fresh water cooling system, using sea water as a cooling medium, cools the engines, while its lubricating oil is cooled by the engine fresh water. Inasmuch as the diesel engine is equipped with centrifugal sea water pumps, their location in the vessel and the design of the cooling system is such as to insure positively flooded suction at the pumps at all times. The total weight (dry) of the Model 8-278A diesel engine and reverse-reduction gear, mounted on its common base, and including all auxiliaries, motor-driven combined lube oil and sea water pumps and control, motor driven lube oil pump and control (standby), spare parts, and tools is but 45,693 pounds, a decided advantage considering the type of service in which the F. C. Randall will be engaged.

The clutch-reverse-reduction gear unit is a combination of a marine reduction gear and clutch. The drive consists of a simple train of a single reduction gear and a reversing pinion, driven from a quill around the forward pinion shaft by a set of idler gears. The clutch portion consists of a forward and reverse clutch, of the Airflex marine constricting type. The reduction gear ratio is approximately 3 to 1.

This combination unit is equipped with two constricting type air operated clutches which provide flexible and resilient connection between the engine flywheel and driving drums mounted at the high speed end (engine end) of the gear unit. Clutch glands may be selectively inflated to obtain desired rotation of the propeller shaft. The air control valve, with ahead, astern and neutral positions, connects the glands through the air shaft and rotating seal. Movement of the air shift valve connects one or the other of the clutch glands to the air supply, the control being automatically governed so that it is impossible to inflate both glands at the same time.

The reverse and reduction functions are combined within a single housing, and in ahead rotation the drive acts precisely as a conventional single reduction unit. The forward clutch engages and drives the "ahead" drum, which is mounted directly on the pinion shaft. For astern rotation the pilot control is placed in the "astern" position. This is followed immediately by deflation of the "ahead" clutch gland and inflation on the reverse or "astern" gland. The latter engages and drives the "astern" drum which is mounted on a reversing tube concentric with the high speed pinion, which drives through idler gears to reverse the rotation and then to a pinion engaging the main gear. The change in rotation takes place entirely at the high speed and where the torque is lowest. A supply of air at 100 psi, for inflation of the ahead and astern clutch glands, is obtained from the engine starting air storage tanks through the clutch air pressure reducing valve. Proper lubrication and cooling of the propulsion reduction-reverse gear unit is provided by a motor-driven combined lubricating oil and cooling water pump unit, while one motor-driven lubricating oil pump which is the same as the lubricating oil pump of the combined units is provided for standby service.

The F. C. Randall is now in service from Gulf ports to Cuba and the northern coast of South America to and from Cuba. The proven advantage of a tanker of this type in war service is expected to greatly expand the service and distribution of Sinclair Oil products in the above markets.

Controllable Pitch Propellers On New River Craft

(Continued from page 91)

maneuverability, allows the engines to operate at maximum efficiency at different loads and river depths.

Immediately forward of the engine room is a 35 by 20 foot compartment containing electrical apparatus. Two GM 30 kw generator sets operate continually while a third functions as a standby plant for emergency use. Instruments including shaft tachometers, engine oil pressure gages, low oil pressure alarms and water temperature alarms are located here at the engineer's control station. Propeller controls, throttles and shaft tachometers are duplicated in the pilothouse.

Fuel bunkers located in the bow section of the power unit have sufficient capacity to allow a full load cruising radius of 2300 miles.

Each vessel is steered by two double plate streamlined


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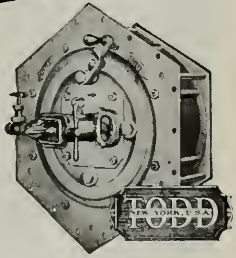
TODD
NEW YORK, U.S.A.

Controllable Pitch Propellers On New River Craft

(Continued from page 134)

rudders operated in unison by a single electro hydraulic ram. Other ultra modern and time saving devices that have been installed include an electric intercommunicating telephone system, an R.C.A. 75 watt Radiotelephone, and Bell radio ship-to-shore telephone system.

Improved loading techniques, many of which were the outgrowth of wartime experience in moving hundreds of thousands of motor vehicles to military installations and southern ports, have been adopted. Vehicles are loaded from floating deck barges that are equipped with ramps, so placed as to enable simultaneous loading of all four decks. Six hundred automobiles can be placed on board in about four hours. This is in contrast to old crane loading methods which take up to twenty-four hours to load the same number of cars.

During the trial runs just completel, top speed in excess of 14.5 miles per hour were obtained. Turning tests indicated a high degree of maneuverability even under adverse wind conditions.

With three times the carrying capacity of previous type carrier barges and one-third the in-transit time, St. Louis Shipbuilding and Steel Company and Commercial Barge Lines, Inc., are both confident that the Commercial Clipper and Commercial Express are ushering in a new era in the transportation or river cargo.

Reblading Turbines At San Francisco

(Continued from page 67)

bine on the Cornell when failure of the lubricating oil system caused the rotor bearings to "wipe" or burn out. When this occurred, the rotor dropped in the bearings. This caused the rotor blades to strike the casing and the casing blades to strike the rotor, thus damaging both sets of blades.

When the Cornell put in at Bethlehem's San Francisco Yard, both turbines were removed from the ship and transferred to the machine shop where the rotor was taken out of each rotor casing. The shop is currently engaged in reblading the lower half of the casing in its entirety with several thousand blades. The rotor blades also were removed and are now being completely renewed. Packing gland seals and dummy packing in the diaphragm are being renewed.

The high pressure turbine is being partially rebladed, cleaned and checked.

After the damaged blading was removed and before installation of new blades, the low pressure rotor was placed in a lathe and checked for alignment. When the reblading operation is complete the rotor will be balanced dynamically before being installed in the casing. Final machining operation will take place when the rotor blades are checked for clearance with the blades in the casing.

▼

Bethlehem's Yard Manager T. C. Ingersoll explaining turbine reblading job to Pacific Marine Review Editor, T. D. MacMullen and Navy Captain Donald L. Irwin, Supervisor of Shipbuilding at Bethlehem.

▼

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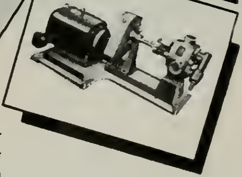

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The Sextant

(Continued from page 96)

Use of any abrasive will gradually eliminate the graduations on the arc.

Use alcohol, fresh water and tissue paper to keep the mirrors clean and bright.

If the sextant is to be stowed away for a long period, the arc should be coated lightly with vaseline.

Adjusting The Sextant

Although a sextant is strongly made, it is still a delicate instrument and must be handled carefully. It may receive some accidental damage. A light blow is apt to put it out of adjustment.

Never adjust your sextant too much. If there is an index error, leave it and allow for it until you get a calm day and then correct the adjustment. When the index error has been corrected for, if there is any small quantity remaining this should, if possible, be made "off the arc" (a plus correction), because an additive index error is much simpler to apply than a subtractive one.

The practical navigator tests rapidly for index error by setting the index arm exactly at zero and observing the sea horizon.

Never adjust your sextant by using a near object, because owing to parallax the results will be unreliable.

Don't torment your sextant—the term applied to over-adjustment of the sextant—as, if the adjusting screws get loose, they will no longer hold the adjustments in place.

Converting a Victory

(Continued from page 99)

and two aft of the machinery space. These are spaced to take the run off from the hoppers. They form runways for two scraper systems which drag the cement either forward or aft to dump into discharge hoppers in the cargo machinery spaces. From the hoppers the cement will be pumped ashore by powerful pumps aided by compressors and having a capacity to handle at least 8000 cubic feet, or 376 short tons, in an hour, when discharging through 1000 feet of flexible piping.

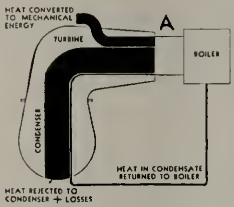
The miscellaneous rock will be handled by the same scraper system but will be loaded by the discharge hopper onto a conveying system for delivery ashore.

Modern Marine Boilers

(Continued from page 94)

five pound bled steam goes to the second stage deaerating feed water heater and the gland ejector. Eight pound bled steam is used in the first stage feed water heater.

From the condensers of the ejectors serving the main turbine condenser the condensate goes through the cooler of the drain from the first stage heater being joined enroute by the condensate from the auxiliary condensers, thence to the first stage heater where it arrives at 100°F. and emerges at 170°F, thence through the condensers of the gland ejector to the deaerating second stage heater, arriving at 173° F. and emerging at 240° F. The deaerating heater is usually of the direct contact type, is located in an elevated position and is of sufficient capacity to act as a positive suction head tank for the main feed pumps. Condensate at 240° F. is taken from the No. 2 heater and forced through the third stage heater to emerge at 315° F. and go on through the economizer into the boiler. The benefits gained from this regenerative heating of feed water are graphically shown in Fig. 3, which indicates that in comparison with the non-feed water heating cycle the regenerative feed water heating system requires 9% less heat supplied by the boiler.



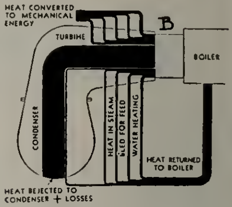


Fig. A. Heat loss in condensing cycle. Heat flow diagram for typical condensing turbine not utilizing staged feedwater heating, showing heat converted to mechanical power, heat returned to system in condensate, and heat rejected to condenser. (Westinghouse)

Fig. B. Heat recovery with staged feedwater heating. Typical heat flow diagram for staged or regenerative feedwater heating installation. Heat supplied by boiler is reduced about 9 per cent, because less heat is rejected to condenser. Savings in heat consumption of 5.31 per cent are possible, depending on steam pressure and number of stages of heating used. (Westinghouse)

This modern system is responsible for much of the auxiliary steam piping and many of the valves in modern marine power plants and is one of the big reasons why the marine engineer today must be always alert and very much on the job to see that all of the connections, fittings, and equipment in this system are kept tight, clean, and properly insulated against loss of heat. If everything is right such a system should operate at approximately 0.6 lbs. of oil fuel per shp per hour with steam conditions 450 psi and 750° F. and with plant operating approximately at rated capacity.

Contracts for Trans-Arabian Pipe Line

Trans-Arabian Pipe Line Company has placed orders with Consolidated Steel Company of Los Angeles for 980 miles of pipe and with National Tube Company of Pittsburgh, Pa., for 70 miles of pipe to be used in constructing the Trans-Arabian pipe line.

Contracts have also been awarded Chicago Bridge and Iron Company of Chicago for erecting 14 tanks, and Graver Tank & Manufacturing Company of East Chicago, Ind., for erecting 22 tanks of an aggregate total capacity 5,700,000 barrels.

Contract was awarded to Bechtel Brothers of San Francisco and associates, including H. C. Price Company of Bartlesville, Okla., for constructing about 600 miles main line and 4 pump stations at Eastern end.

Williams Brothers Corporation of Tulsa awarded contract for constructing approximately 450 miles of main line at western end and also Mediterranean tanker loading terminal. Graver was also awarded contract for constructing two intermediate pump stations at western end.

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ARINE
EVIEW

IL, 1947

MEN *and* ROPE

For 40 years, old timer Louis Di Gregorio (beside forming machine) has been an employee of the Tubbs Mills.

As in the illustration, it requires specially designed machines like these to twist together the rope yarns and form them into the rope strand. But in addition, it takes skilled MEN to operate these machines—to carefully check and supervise the process at every stage — to assure a finished rope product that will give the fullest measure of wear and service.

This combination of MEN and ROPE in the Tubbs Mills has assured a product that stood for "plus value" in its field—a rope dependable under all conditions and usage.

Tubbs Extra Superior Manila rope is now available in ALL sizes for all end uses. Specify TUBBS to your supplier. You will find it a rope that will give you the maximum in value for your rope dollar.

TUBBS EXTRA SUPERIOR MANILA CORDAGE COMPANY

See our exhibit at Booth No. 39 at the Second Annual National Marine Exposition, Civic Auditorium, San Francisco, May 12 to 17, 1947.

TUBBS CORDAGE COMPANY

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With the Port Engineers

Pacific World Trade By T. Douglas MacMullen

Marine Insurance

Coast Commercial Craft

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Pacific MARINE REVIEW

ARE PORT CITIES CONSCIOUS?

ON PAGE 65 OF THIS MAGAZINE, there appears a little Maritime design which is the seal of the Chamber of Commerce of Newport Beach, California. This small but beautiful port city is setting an example which many larger cities could very well follow.

Impressed not only on the official seals of our cities, but on the *minds* of officials high and low and of every business enterprise, should be some reminder of the importance of shipping and port activities to their people. Every bit of legislation should be integrated with the welfare of shipping wherever possible, and selfish and competitive interests should retreat when the welfare of the port is in jeopardy. In every major port area the population is concerned with just about every conceivable interest from beauty and grace to homes and employment and national defense. It would seem that within such a range there would be some point at which city officials would find a community of interest with the welfare of their shipping industry, and the people in it.

The people in it! Not just "a few along the piers," as one official thought recently. There are quite a few! In the San Francisco bay area there are, in April 1947, over 35,000 employed in shipyards. Can any other industry match this? No. Not even the liquor industry, which seems to swing a lot of influence when needed.

But the shipping industry only starts in the shipyards. There are 8,000 in longshore and port activities. There are 10,000 seagoing personnel working out of San Francisco; steamship offices have 3,000, world trade and cargo handling 9,000 more. And marine insurance and banking and warehousing and rail and truck service and yachting. *All people.* Their money flows in every channel. They are *important.*

It has been said—and *we* have said—that the industry needs a great spokesman who will command the attention of the public, the press, and the government. *How about our city officials being such spokesmen?*

It would not be amiss—in fact it could be a *must*—for some representative of the city to be at every meeting of the Propeller Clubs, Foreign Trade Associations, and other shipping groups. To the Supervisor, or Councilman, or Newspaper Editor who loves his city and wants a cause in which he can serve it well, we can give plenty of leads.

SUPPORT THE GOLDEN BEAR

THIS IS NOT A PLEA FOR FOOTBALL FANS nor for astronomical study, or any such mundane enthusiasms. We are here calling attention to the steamer Golden Bear, just returned from a cruise that is part of the California Maritime Academy curriculum for training officers to serve in the American Merchant Marine.

For 16 years this Academy, patiently working over successive classes of young men, has produced many useful officers in the deck and engineers' departments and has gained the respect and confidence of the ship operators of the Pacific Coast.

Today with a new, modernly equipped training ship, SS Golden Bear, and a practically new shore station strategically located on the upper reaches of San Francisco bay, the State Maritime Academy under competent management and with an excellent faculty is ready to train future officers for the Pacific American Merchant Marine.

This institution derives some of its financial support from the Federal Government, and some from the State as a part of the public school system. It needs the moral support of the people of the State in two ways.

First, in these days of popular demand for retrenchment in government spending and reduction in taxation, the friends of C.M.A. should be vigilant to see that its support is not dangerously trimmed by either the State legislature or the Federal congress. Second, there should be active support for the campaign to keep the advantages of the Maritime Academy training prominently before the high school students of the State.

The discipline and training of the deck or engineer officers curricula in this school are in themselves extremely valuable to the students. The yearly cruise of the training ship is also very valuable not only to the student as a broadening influence and a study in economic geography, but also to the State and the Nation, as these bright young lads landing at South and Central American or Oriental ports are first class advertisements for California and are the finest type of good-will ambassadors for the American good neighbor policy.

It is up to every good California citizen to support the California Maritime Academy with votes and influence in a manner commensurate with the length of our coast line.

MATSON LINERS RECONVERSION

THE MOST EXTENSIVE MERCHANT SHIP reconversion project ever undertaken by a single ship operating firm in United States maritime history is now well underway in the San Francisco and Alameda yards of the United Engineering Company. This is the rebuilding and the complete modernization of the three luxury and passenger liners of the Matson Navigation Company.

When completed these three vessels, SS Lurline, SS Mariposa and SS Monterey will comprise the finest, fastest and most modern passenger fleet under the American flag. Each vessel will be practically "brand new" and unexcelled in modern design, efficient equipment, and passenger comfort.

First of the three to be delivered will be Lurline, scheduled to be ready for service in early September. All three are expected to be completely finished before the end of the year.

When finished, the three ships will be practically identical in every respect. The job undertaken on each vessel has been likened to the building of a first class modern hotel within the confines of the vessel's hull plus the many complicated engineering factors due to the neces-

ALUMINUM SUPERSTRUCTURES
Above the sundeck of the Matson liners as reconverted will rise two long houses of steel frame sheathed with aluminum. These erections take the place of the former wooden houses. All partitions in the new passenger and crew quarters will be of aluminum faced marinite. The arrangement of these spaces plus the fireproof nature of the materials and the method of construction combine to make these vessels more safe from fire menace than any afloat today.

sity of moving this hull over the ocean at a sustained speed of 20 knots plus, and of storing and maintaining aboard all the culinary and sanitary and public utility services necessary for the comfort, convenience and recreation of modern men and women.

Some idea of the magnitude of the job involved is indicated by the man-hour figures which now total approximately 55000 per week on each vessel. Figures issued by Matson Navigation Company reveal the following quantities of materials purchased for the total job: 50 carloads of new electric cable; 310,000 square feet of rubber tile, and 90,000 lineal feet of tile trim, to be laid as interior deck covering at a cost close to $100,000 per ship; 4500 metal doors; 3500 tons of steel; 984 telephones; 35 carloads of cork slabs; and 1,500,000 square feet of fire proof aluminum sheathed marinite.

When finished, each of the three ships will accommodate 726 passengers, 488 in first class, and 238 in cabin class. The prewar passenger capacity were: 701 on Lurline; 728 on Monterey, and 715 on Mariposa.

The principal characteristics of these vessels are shown in the table herewith. The power plant on each ship consists of 12 Babcock and Wilcox, inter-deck superheater, standard marine type, water tube boilers, arranged in two boiler rooms and supplying steam at 360 psi and 650°F. throttle, to two sets of triple expansion Bethlehem-Parsons turbines, each set driving its line shafting through Falk single reduction gearing, three pinions driving one large gear. Speed of propeller is normally 125 rpm and that of the turbine approximately 1600 rpm. Under normal conditions this plant drives the hull at 20.5 knots speed. On the original trials of the Lurline with everything wide open, the turbines generated 30,000 shp and drove the hull at a maximum speed of 22.5 knots. Fuel consumption figured at 0.625 pounds shp.

Use of Aluminum

Interesting in this conversion is the large use of aluminum in the superstructure and in partitions for passenger and crew accommodations. On the sun deck, the wooden houses for crews' quarters were entirely removed and a steel frame house with aluminum sheathing erected. This house extends from frame 119 to 151 and in addition to crews' quarters, contains a room for air conditioning equipment and the pent houses for the elevators. On top

PRINCIPAL CHARACTERISTICS

Length Overall	632′0″
Length Waterline	628′0″
Length B. P.	605′0″
Beam Molded	79′0″
Depth Molded C. Deck	52′9″
Draft Molded	28′0″
Displacement on Draft	26000 tons
Gross Measurement	18017 tons
Net Measurement	10580 tons
Normal Shaft hp	22000
Sea Service Speed	20.5 knots

of this house at its forward end is a compass platform with standard magnetic compass and gyro-repeater.

In all passenger, officer, and crew accommodation spaces the hulls were stripped to the bare steel and all quarters re-arranged and rebuilt in accordance with the new subchapter "M" of U. S. Coast Guard regulations which now govern in the construction arrangement, and equipment of passenger and crew quarters and which is especially addressed to fireproofing, fire resistance, the confining of fire, fire escape and fire extinguishing. These three vessels when finished, will be the first passenger liners to fully comply with the new regulations, and since these regulations are well in advance of those governing in other countries, it can be truthfully said that these Matson liners are the safest afloat so far as fire is concerned.

All partitions in the new arrangement of quarters are of Johns-Manville marinite faced with aluminum. The joiner work in these quarters was all done by Hopeman Bros. of New York. On the boat deck, the afterhouse was extended forward port and starboard abreast of the after stack casing, from frame 80 to frame 94. This addition is steel frame with aluminum sheathing.

B Deck Changes

The most important structural changes in the hull are on the "B" deck level. Here the "B" deck promenade is eliminated and the house extended to the ship's side. Hull frames are extended to "A" deck and "A" deck beams connected to frames, girders strengthened and new side

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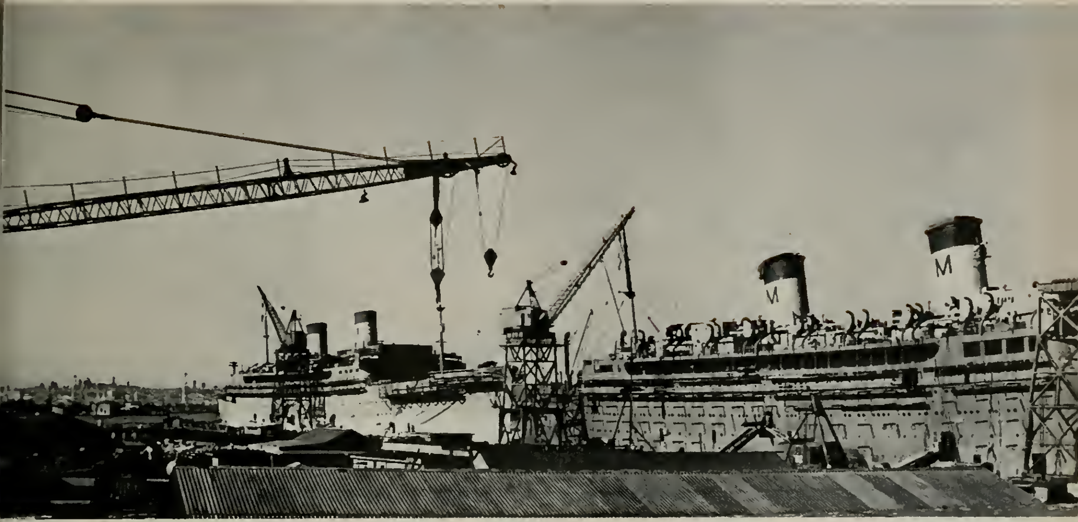


Sisters under the scaffolding. Stripped of their former luxury appointments the Matson liners Monterey (foreground and Lurline are undergoing rebuilding and complete modernization at the Alameda yard of the Matson subsidiary, United Engineering Co. At the present time 150,000 man hours weekly are being spent on the trio bringing them up-to-the-minute with such features as complete air-conditioning, radar, and fireproof construction throughout.

plating fitted. The space thus enclosed is arranged for and fitted with new passenger quarters. "B" deck is extended forward over the well deck, in a completely new structure, with A.B.S. regulation frames, deck beams, brackets, stanchions, deck plating, and shell plating. This large additional enclosed space is devoted to crews' quarters and to air conditioning machinery rooms.

Hull Repairs

The stacks were modified by removal of the umbrella tops and the recessing of the whistle and whistle platform in the forward stack. All exterior damage to the hull was repaired and fashion plates port and starboard at the after ends of A, B, C, and D decks altered and renewed to conform to profile of the vessel. In this process, the entire exterior was sandblasted to the bare steel, and wherever plates were deteriorated or damaged they were renewed. In most of the service spaces of the ship all equipment was removed for overhaul or renewal and the decks and bulkheads were cleaned and scaled to the bare steel and repainted. Spaces so treated included passenger and crew hospital; surgery; laundry; print shop; all linen storage spaces; tailor shop; all storerooms and lockers; main galley and crews galley and bars and pantries.

In the galleys, all equipment was thoroughly overhauled and much of it renewed. All food handling and storage spaces were effectively rat proofed according to U. S. Public Health Service regulations. New deck covering and new waterways were installed in the main galley to conform with U. S. Public Health Service rules. Crews' mess rooms and pantries were relocated and re-equipped.

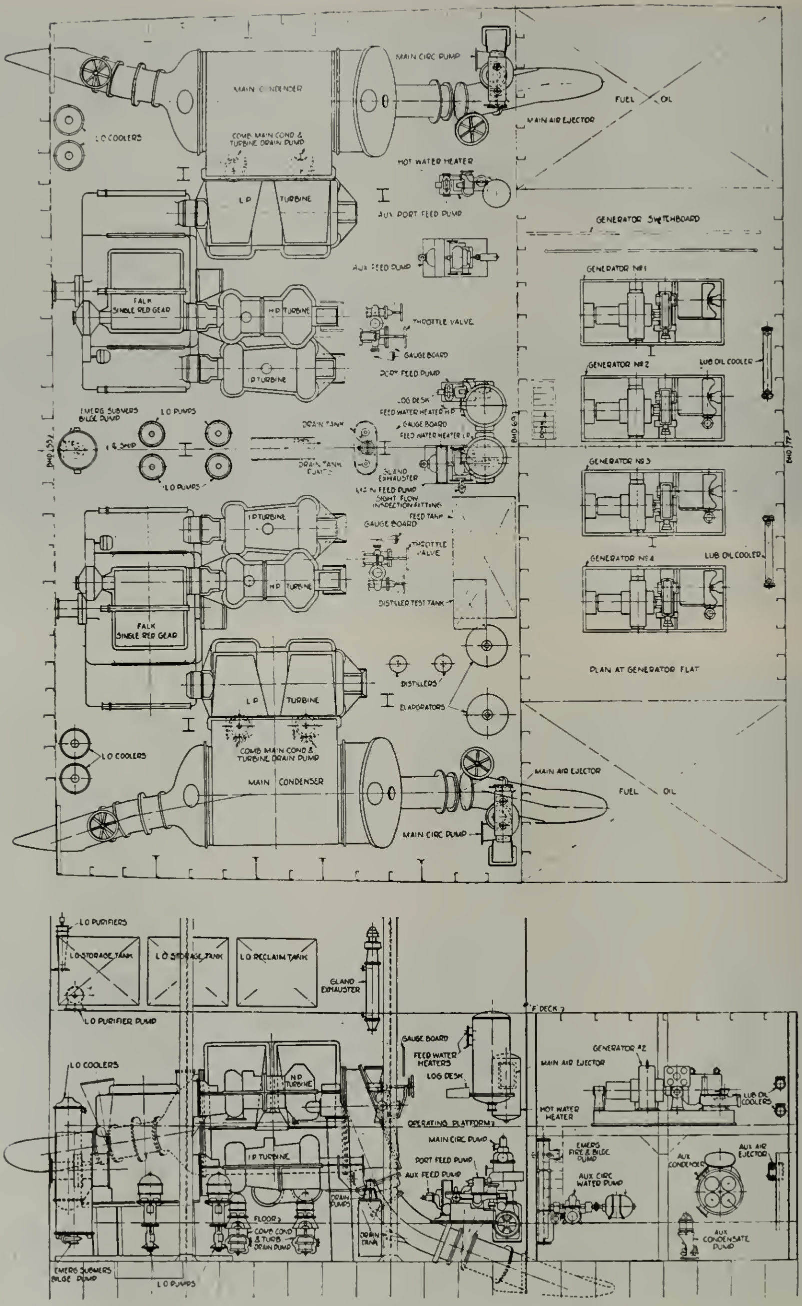
Electrical

New electrical equipment and new wiring systems were installed throughout the ship for such services as: ship service and passenger service telephones; stewards' call bell system and annunciators; emergency loud speaker system; general alarm bell system; public address system; fire detecting system; fire door control system; water-tight door control and signal system, and telemotor wiring.

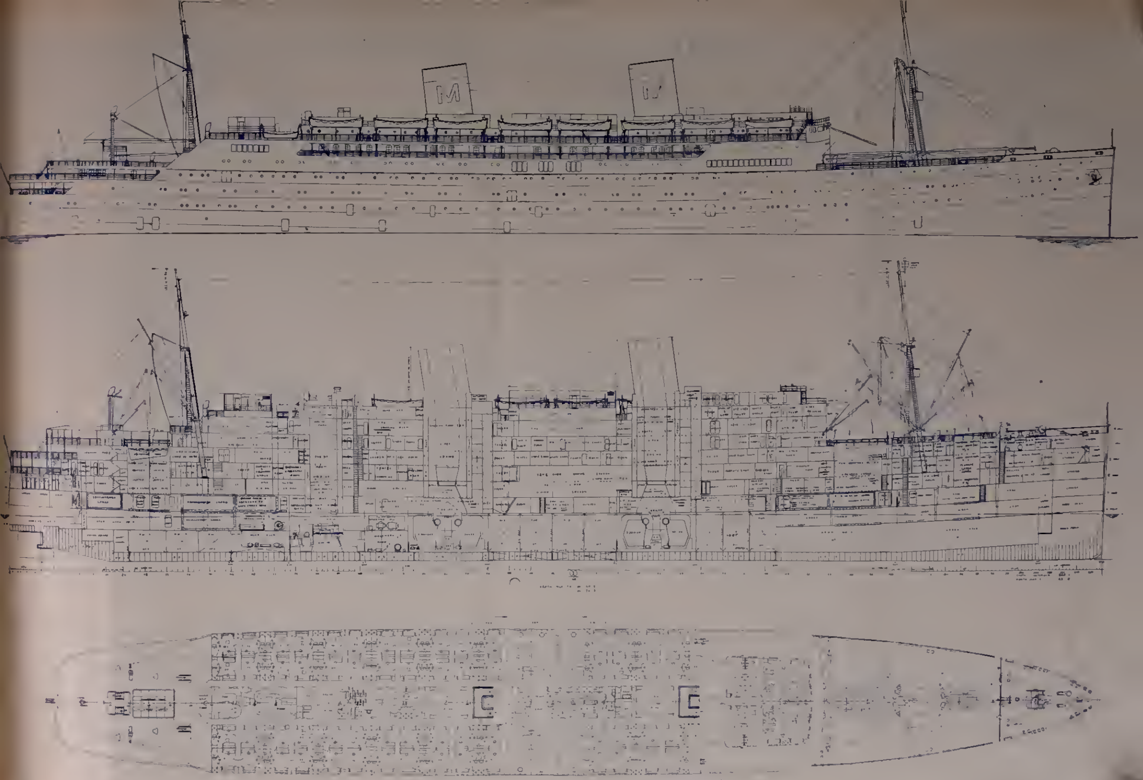
The fire detecting and fire extinguishing systems originally furnished by Walter Kidde & Company, Inc., have been altered to suit the re-arrangement of the vessels.

The Rich Smoke Detecting System has been altered to provide fire detection for the cargo spaces.

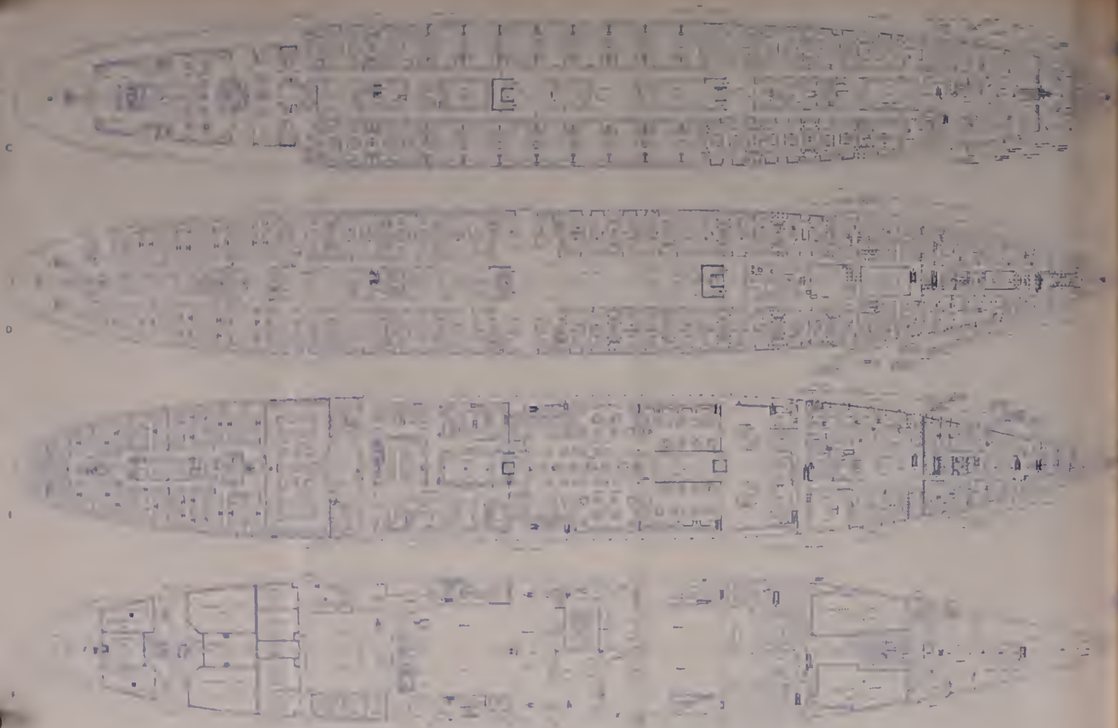
The Lux (Kidde) System has been extended to cover the domestic refrigerator boxes, so that now all the spaces on the vessel occupied by cargo and machinery are protected with carbon dioxide fire extinguishing.



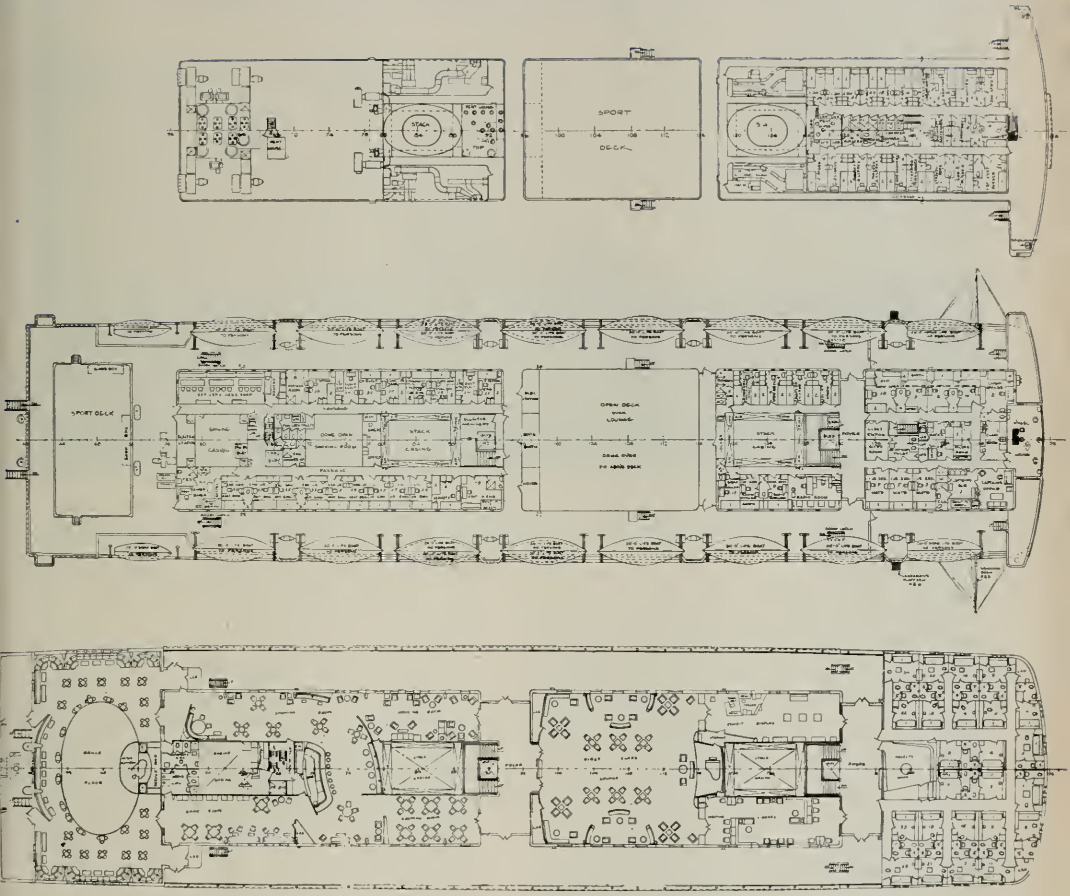
Plan and elevation of machinery arrangement.



Outboard and inboard profiles and general arrangement plan of B deck



General arrangement plans of C, D, E and F decks



General arrangement plans of Sun, Boat, and A decks.

The Selex System has been revamped and altered to suit new arrangement of passenger spaces in accordance with the latest requirements of the United States Coast Guard.

These alterations were made under the supervision of Hough & Egbert Company, San Francisco.

Complete new radio transmitting and receiving equipment with radio telephone incorporated was installed. The emergency generator set was renewed and a motor-generator set and standby installed together with an alternating current distributor system for certain uses. Motion picture equipment was entirely renewed and projection booths modified to conform with new fire prevention rules.

Deck Fittings

All boat davits were completely rebuilt together with life boat winches and davits. All defective life boats and life boat falls were renewed. This work was done to the requirements of the U. S. Coast Guard and the American Bureau of Shipping. All passenger elevator equipment was removed, the trunks repainted and new automatic elevator equipment installed. Freight elevator, engineer's elevator and all dumb-waiters were overhauled and put in first class working condition. Baggage conveyors were substituted for the two baggage elevators. All chocks, bitts, and fair leaders were overhauled and where advisable, relocated. Windlass capstans, and cargo winches were completely overhauled and parts renewed and standing rigging altered. Awning stanchions and spars were reinstalled.

The steering gear and the emergency steering gear were thoroughly inspected and properly conditioned and the telemotor unit completely renewed.

All navigation equipment and engine room telegraph, revolution indicator, and other pilothouse instruments were put in first class condition, and a new radio direction finder installed. The existing radar equipment was checked and relocated and a new radar mast erected on top of the foremast.

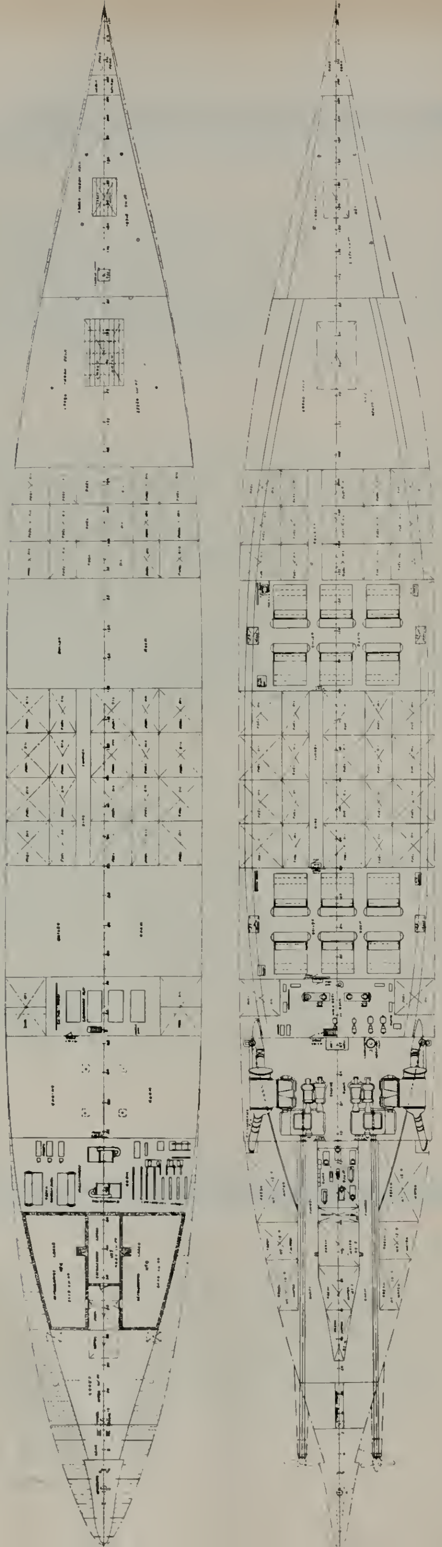
Refrigeration

All of the cargo and ships' stores refrigeration boxes were torn out and entirely rebuilt providing a total refrigerated net cargo capacity of 61,200 cubic feet. Completely new Carrier Freon refrigeration machinery was installed to take care of the cargo and ship stores and also to handle the large air conditioning load. This machinery is located on "G" deck machinery flat at the after end of the engine room. Space here was made available by the removal of the large fresh water tanks port and starboard formerly occupying this flat. A pump room was constructed in the fresh water tank below this flat.

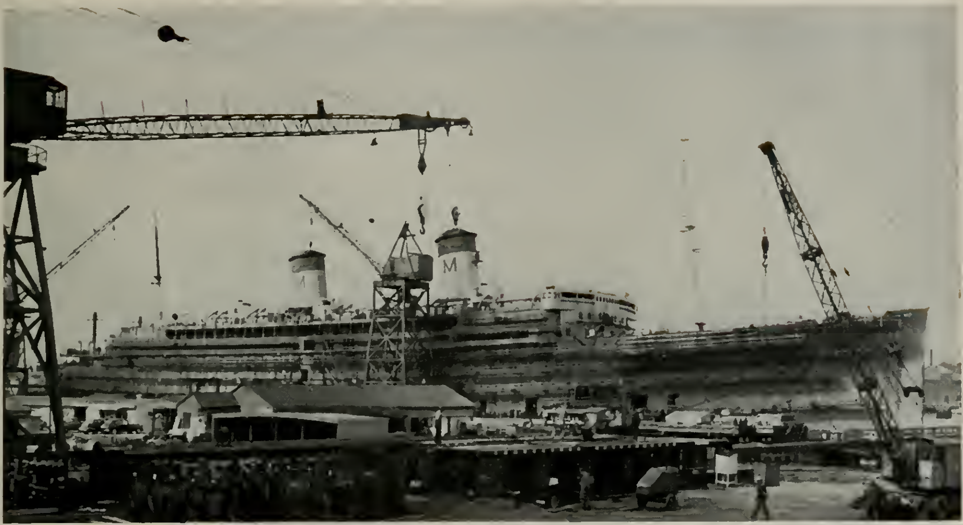
All of the refrigeration boxes and chambers were constructed to suit Matson insulation and cold distribution specifications which have been developed by special research to adequately meet the requirements of this line. These specifications and the methods by which they are applied result in a very high ratio of net cargo cubic, a very effective insulation, and a very effcient distribution of cold air through the cargo.

Fresh Water

A very interesting new installation on these vessels is the large evaporating capacity for supplying fresh water. Two new low pressure evaporators each with a capacity for producing 40,000 gallons of water per day



General arrangement plans of G deck and tank tops.



Fifty thousand man hours per week are now being expended at the Alameda, California yard of United Engineering Co. to rebuild and modernize Matson Line's S.S. Monterey after five years of transport duty. When completed, during the latter part of this year, the fully reconverted luxury liner will join her sister ships Lurline and Mariposa, also in the process of modernization, in service between California ports, Hawaii, the South Seas, New Zealand and Australia.

keep the fresh water tanks pressed up tight. A complete new chlorinating system including hypo-chlorinator units, retention tank, pumps, and necessary piping keeps this water supply in condition to fulfill all the requirements of the U. S. Public Health Service. It is anticipated that this feature will prove to be of advantage not only in providing ample supplies of potable water but also in maintaining a smoother riding ship in comparison with the former large tanks gradualy emptying as the voyage progresses.

Propulsion Machinery

All of the machinery in the engine rooms was completely reconditioned. Main turbines were removed from the ship, sent to maker's shops, and the rotors and cylinders rebladed where necessary. Rotors were balanced, valves adjusted, and the entire turbine made like new. Condensers were retubed and repacked. All pumps were overhauled, thoroughly cleaned and repacked. All steam piping and valves inspected, gaskets renewed, piping and valves re-insulated. Thousands of new blades were installed in the 18 turbine rotors of the three ships. Inspection of the 12 boilers on the Lurline revealed a number of tubes needing renewal, particularly in the superheaters. Brickwork in the furnaces was completely renewed. New lube oil purifiers were installed in the engine room. The electric generating sets were overhauled, cleaned and parts renewed where necessary.

When the Lurline goes into service in September, she should perform like a new ship and she will be greatly improved in the appearance of her profile by the elimination of the well deck forward.

Passenger Accommodations

In addition to the change from promenade to enclosed passenger quarters on "B" deck which we have already described, the principal change in arrangement of staterooms is the moving of the famous "Lanai" suites from the forward end of "A" deck to "B" deck amidship. All of the first class rooms are larger and most are fitted with convertible beds which disappear into recesses during the day, removing all semblance of a bedroom and transforming the apartment into a living room. Each first class room has private bath and toilet with complete separation between the two. New rugs, fabrics, and lighting fixtures will follow a modern decor motif and lavish use of sponge rubber upholstery will contribute to luxurious comfort.

The public rooms on "A" deck follow the original arrangement with the exceptions that: the bar has been moved to a central location in the main smoking room and the room formerly occupied by the bar is now a game room; the dance floor in the dance pavilion and cafe has been changed from square to oval; the former library space has been devoted to exhibit displays; and the library has been housed in part of the writing room.

All of these changes are made in a manner to enhance the work of the interior decorator which will largely follow the Polynesian motif.

The public rooms are all equipped with built-in speakers for radio and recorded music. Accoustically treated ceiling will greatly improve the broadcasts.

Perhaps the most important addition from the passenger comfort viewpoint, is the great increase in air conditioning. Every stateroom will be fully served with Carrier Weather Master conditioned air and each room will have its own controls so that individual preferences in temperature and humidity may be easily obtained.

The dance pavilion at the after end of "A" deck looks aft and down at the swimming pool in the after cargo hatch on "B" deck. The deck here is a large open area around the tank and makes a very pleasant lounging space for bathers.

Dining Rooms

Matson cuisine has always been maintained on a very high level of excellence. The practically new electric galleys on these reconverted vessels will be completely air conditioned as will be also the dining rooms. This improvement alone should enable the stewards' department to produce better meals and certainly it will improve the appetites for, and appreciation of those meals on the part of the passengers.

There is every indication in the reconversion that this trio of fine passenger liners—very popular before the war—will be even more popular in the coming years.

22 Matson Ships Get New Names

Matson Lines announces a naming program for its new freighter fleet.

Sixteen C-3s which will constitute the backbone of the fleet, will carry names in an occupational pattern, each occupational name being proceeded by the word "Hawaiian." This carries forward the naming plan inaugurated by Matson just prior to World War II, with the Hawaiian Shipper, Hawaiian Merchant, Hawaiian Packer and Hawaiian Planter. Of these, two had been delivered to Matson and two were still under construction when war was declared, the Government requisitioning all four upon the outbreak of hostilities.

The first fifteen of the Matson C-3s will bear the following names:

Hawaiian Merchant, Hawaiian Builder, Hawaiian Planter, Hawaiian Banker, Hawaiian Craftsman, Hawaiian Educator, Hawaiian Retailer, Hawaiian Citizen, Hawaiian Fisherman, Hawaiian Packer, Hawaiian Rancher, Hawaiian Farmer, Hawaiian Refiner, Hawaiian Pilot, Hawaiian Wholesaler.

A name for the sixteenth C-3 has not yet been selected.

Three Liberty-type vessels which will be principally engaged in carrying lumber, fertilizer and other bulk items between the Pacific Northwest and Hawaii will be named: Hawaiian Forester, Hawaiian Lumberman, Hawaiian Logger.

Fur C-2 freighters to be operated between Pacific Coast ports and Australia-New Zealand by Matson's wholy owned subsidiary, The Oceanic Steamship Company, will be named for California counties, as follows: SS Sonoma, SS Ventura, SS Sierra, SS Alameda.

The Matson freighter fleet will consist of these vessels plus certain members of the prewar fleet, of which the following are presently in service and which will continue to carry their original names: SS Manulei, SS Manulani, SS Manukai, SS Mokihana, SS Mahimahi. Other ships of the prewar Matson fleet have been sold or retired from service.

The naming program will be carried forward as the new ships become available for service following their conversion in various shipyards on the Atlantic, Gulf and Pacific Coast to meet the special requirements of the trades they will serve. The conversion program is well under way.

With the new freighter fleet of sixteen C-3s, four C-2s and three Liberties, plus the vessels held over from the prewar fleet, Matson and Oceanic will provide freighter service over the following routes:

1. Direct weekly sailings between San Francisco and Hawaii.
2. Direct weekly sailings from Los Angeles to Hawaii.
3. Direct fortnightly sailings from Seattle, Tacoma and Portland to Hawaii.
4. Direct weekly sailings (in conjunction with Isthmian Steamship Company) between Atlantic Coast Ports, including regular calls at Gulf Ports, and Hawaii.
5. Monthly sailings between Pacific Coast ports and Australia-New Zealand via South Seas island ports.

SARINA IS NOW HER NAME—Originally owned by Max Fleishman and known as the M/S Haida, she was next taken over by the U. S. Navy and was called the Argus. Now she has been purchased by the East Lane Shipping Co. for use by its President, Joe Adda, as a pleasure craft.

Yacht Haida to Motorship Sarina

FOR MANY YEARS, Max Fleishman's sleek, black hulled yacht Haida was a familiar coastal sight, especially at Los Angeles Harbor where she periodically stood out to sea, bound for pleasure cruises.

During February the veteran departed the Martinolich Shipyard pier in San Francisco bearing small resemblance to the Haida of prewar days. Completing her career as the USS Argus with distinction, she was purchased from the Navy by the East Lane Shipping Company for that firm's president, Joe Adda.

Reconditioned and renamed the M/S Sarina, in honor of Mr. Adda's original Sarina which was suddenly sunk in the harbor of San Ramo, although flying the Egyptian flag, the new Sarina will sail under the flag of Panama, with Panama City as her port of registry.

The new Sarina, or ex-Haida as one perfers, gets her main power from two 750 hp Krupp diesel engines and also has two 80 hp Krupp auxiliaries. They are the vessel's original power plants, having been built for Mr. Fleishman in Germany in 1929.

On her maiden voyage to Genoa, Italy, 28 days away at 14 knots, the new Sarina had two things in common with her namesake predecessor. On her bridge was Capt. G. Piccuni whose home is in Lussinpiccolo, Italy, and who commanded the original vessel. And, like her predecessor, she was using Socony-Vacuum lubrication products exclusively, says Frank Scott, marine representative for General Petroleum.

At right is the ship's captain, G. Piccuni of Lussinpiccolo, Italy, while at the left is Frank Scott, Marine Sales Representative for General Petroleum Corporation in Northern California, and they were agreed that the Sarina should use Socony-Vacuum lubricating products throughout. It is the second Sarina to do so, and Captain Piccuni has been skipper of both.

TWO BIG DREDGES AND A LONG TOW

TWO PLACER DREDGES FOR TIN-MINING are now approaching completion at the works of the Tampa Shipbuilding Company, Inc., Tampa, Florida. Designed by Bucyrus Erie Company, South Milwaukee, Wisconsin for the Mining Equipment Corporation, New York, a subsidiary of the Billiton Maatschappy of The Netherlands they are said to be the largest of their kind.

The Bucyrus Erie Company built all heavy special purpose machinery for the dredges, and the Tampa Shipbuilding firm designed the hull and superstructure, built the dredges and installed all machinery.

Built under special survey of the American Bureau of Shipping, to be classed "For Dredging Service," these dredges have principal dimensions as follows:

Length B. P	246′—0″
Beam Molded	76′—0″
Depth Molded to Main Deck at Side	12′—6″
Depth Molded to Main Deck at Center	12′—9″
Total Length, over Gangway Bridge at Bow and Tailing Sluices at Stern	476′—0″

The hull and superstructure are all-welded steel. The hull is divided into 52 compartments by two longitudinal watertight bulkheads and 12 main transverse watertight bulkheads, the ladder well and miscellaneous tank bulkheads. There are four longitudinal trusses extending the full length of the hull. The hull is transversely framed with frames spaced 24″ except at extreme stern where longitudinal framing is adopted.

The hull is further strengthened by a pair of main trusses, 9 ft. off center port and starboard, the upper chord of which is 50 ft. above the main deck, with necessary diagonal and lateral bracing.

At the forward end of the hull a well or slot is provided to accommodate the digging ladder. The well is 8 ft. in width and 140 ft. in length and extends the full depth of the hull, thus dividing the vessel into two separate structures for more than half its length.

The digging ladder is 216 ft. long, 8 ft. wide and 13 ft. in depth and carries an endless chain of 148 cast steel buckets of 14 cu. ft. capacity each. The weight of the ladder, exclusive of buckets and rollers, is 496,000 lbs., each bucket weighs 4000 lbs. empty. The upper or inboard end of the ladder is pivoted on a trunnion 54 ft. above the deck. The buckets are actuated by an upper tumbler mounted on the trunnion and powered by a 250 hp motor and pass over a lower tumbler at the outboard end of the ladder. The outboard end of the ladder is suspended by two 12-part tackles from a heavy bow gantry extending 30 ft. beyond the forward end of the hull. The suspension tackle is operated by another 250 hp motor geared to a quadrupledrum winch on the top chord of the main truss. The outer end of the ladder can be raised or lowered in an arc to dig material from the waterline at a depth of 100 ft. below the waterline.

The dredge is not provided with propelling machinery or living quarters for the crew who will be accommodated ashore.

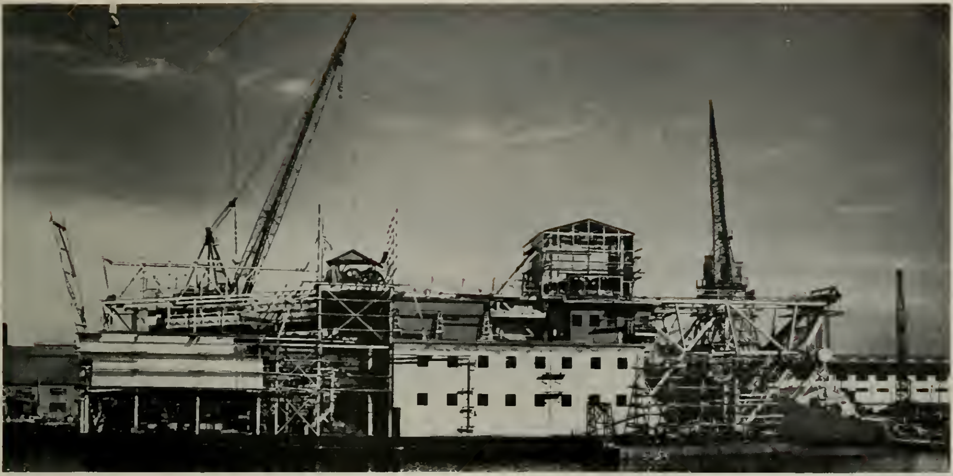
All machinery is electrically operated by 400 volt, 3 phase, 50 cycle alternating current generated aboard the vessel by diesel engine generating sets. The main power plant consists of three Cooper-Bessemer vertical, 4-cycle trunk piston, solid injection, diesel engines, each having eight 13″ x 16″ cylinders, supercharged. Each engine developes 875 bhp at 375 rpm. The three 600 kw generators are direct connected to the engines. The speed of the various motors is regulated by Ward-Leonard control systems.

The dredges will operate in the coastal waters of the islands of Banka and Billiton which lie off the northeast coast of Sumatra near Sunda Strait. They are designed to recover tin-bearing sand and to separate it from other sand, rock, clay, silt, etc.

In operation, the dredge will be moored to heavy anchors and maneuvered by lines from the anchors to winches aboard the vessel.

When digging barren overburden, the material discharged by the buckets will pass over a movable chute, temporarily placed in the revolving screen, to a central sluice extending 120 ft. astern of the hull. When digging tin-bearing sands, the chute will be removed from the revolving screen and the fine material will pass through perforations in the screen plates. The revolving screen is 10 ft. in diameter and 70 ft. in length, weighing about 90 tons.

The tin-bearing sands which pass through perforations of the revolving screen will be fed to a conical distributor from which they will pass through chutes to 24 four-cell primary jigs. The concentrate from the jigs will be passed through funnel classifiers, dewatering devices and concentrating tables and will be loaded aboard



Tin mining dredge Stuyvesant being completed at outfitting pier Tampa Shipbuilding Company, Inc., Tampa, Florida.

(Photo by William W. Carnes, Tampa.)

A Moran Towing and Transportation tug hauling a huge tin dredge en route from Tampa to Banka Island. The 13,000-mile trip through the Panama Canal, across the South Pacific and through the Celebes Sea, Macassar Strait and the Java Sea is expected to take three months. The dredge first of two to be delivered by the company, was constructed as part of the rehabilitation program for the East Indies tin mining industry. The tug, built during the war, was chartered from the United States Maritime Commission.

(Photo Courtesy: Moran Towing & Transportation Co.)

barges for shipment to the refineries. The overflow from the treatment plant will be discharged to the sea through sluices extending 150 ft. astern of the hull.

Various portions of the hoppers and chutes are lined with abrasion resisting steel plates. Other portions of sluices and chutes are lined with synthetic rubber vulcanized to the steel plate.

The first dredge was launched October 28, 1946 and was christened Stuyvesant by Mrs. G. J. Slot, wife of the local representative of the Mining Equipment Corporation. The second dredge, the Roosevelt was launched January 6, 1947, the sponsor being Mrs. V. Houwert, wife of the president of the Billiton Maatschappy.

The dredges were launched stern first from ground ways spaced 28′ 7″ center to center, sloping 11/16″ per foot. The slope of the keel was ½″ per foot. Sliding ways were 15½″ wide and 222 ft. long.

The hull and main truss were substantially complete at time of launching giving a launching weight of 1150 tons, including 135 tons of water ballast in after compartments. Heavy plate brackets, well stiffened, were installed temporarily in the ladder well to tie the port and starboard sides of the hull together. A rotating fore poppet was used consisting of a steel-shod yellow pine rocker of 4′ 3″ radius fitted to the shell and supported on a steel-shod bearer resting on wedges. A dog shore was located on each way a short distance aft of amidship. Final release was made by burning through perforated steel plates at the forward end of each sliding way.

After launching, the superstructure was built and machinery installed at an outfitting pier. Much of the machinery is of very heavy construction and in large units. Principal among these are the revolving screens weighing 90 tons and the digging ladder weighing 220 tons. These were shipped by the Bucyrus Erie Company in sections of suitable size for transportation by rail and were assembled and installed by the Tampa Shipbuilding Company, Inc. The revolving screen was placed aboard by two of the shipyard's gantry cranes.

The seven sections of the digging ladder were assembled on ways of typical launchway construction placed at right angles to the face of the outfitting pier. The dredge was placed with its bow against the pier, aligned with the ladder and moored in position.

The upper tumbler was shod with wood to form a temporary winding drum. To this were attached the two ends of a 2 inch diameter improved plow steel wire rope to the bight of which were attached a series of pendants extending to the upper, or inboard, end of the digging ladder in its assembled position on the ways.

Using the dredge's power plant, the ladder was drawn along the ways until its inboard end projected about 20 ft. beyond the face of the pier. During the operation, the hauling line was progressively shortened by removing the pendants one at a time as the ladder neared the ship. The dredge's ladder suspension tackle on the bow gantry was then secured to a sling passing under the ladder. A 24″ x 24″ timber support was placed across the ladder well to receive the inboard end of the ladder and the ladder was pulled aboard by the line from the upper tumbler being lifted by successive adjustments of the sling from the bow gentry, the outboard end of the ladder pivoting on a heavy steel plate on the upper surface of the sliding ways. When the inboard end of the ladder had been pulled into a position under the upper tumbler, the sling was removed and the suspension tackle made fast to its permanent bridle near the outboard end of the ladder. The bight of the 2″ wire rope was then secured to a heavy cleat on the inboard end of the ladder. The inboard end was then raised and fastened in place on the upper tumbler, control for the final adjustment being maintained by lines to the vessel's winches and to crawler cranes and gantry cranes on the pier. Despite the great size and weight of the ladder and the extremely close clearances involved, the operation was accomplished without mishap.

Concurrently with the construction of the dredges they are being made ready for the voyage from Tampa to The Netherlands East Indies, a trip of about 12,000 miles through the Panama Canal and across the Pacific Ocean. Each dredge will be towed by one of the big V-4-M-A1 diesel ocean-going tugs which have been chartered from the U. S. Maritime Commission by the Moran Towing & Transportation Company. The voyage is expected to take about three months.

In preparation for the voyage, the digging ladder is secured in position well above the waterline with all buckets removed and stowed aboard the dredge. The main deck house inclosing the engine room and machine shop are provided with watertight doors and plate closures over all windows and other openings. Plating is removed from sides and roofs of the treatment house, and from the upper houses enclosing the ladder hoist machinery, the upper tumbler machinery and the revolving screen. These houses extend to a height 80 ft. above the deck and have a maximum width of 106 ft. and would offer undesirable surfaces to storm winds if left intact. The dredge's pilot house is fitted with temporary galley and living quarters for the crew of 8 men who will make the voyage. Life boats, life rafts and other necessary safety equipment are installed, as well as temporary anchors and anchor handling gear. Exposed motors, chutes, sluices and various items of treatment plant equipment are stowed and secured within the machine shop. Canvas covers are provided for exposed motors which must remain in place. All cranes and hoists, from the 25 ton electric travelling crane to the small one-ton cranes, are being securely chocked to prevent any motion. A V-shaped bulwark 10 feet high is provided across the after end of the main deck and heavy temporary shoring is installed in the scow-shaped after compartments to resist the battering of heavy seas which may be encountered on the long voyage, as the dredge will be towed stern first with its bow or ladder end tailing.

JOHN E. CUSHING SUCCEEDS FRAZER A. BAILEY AS PRESIDENT OF MATSON

John E. Cushing will become president of the Matson Navigation Company taking office early in May, announces W. P. Roth, Chairman of the Matson Board of Directors. He succeeds Frazer A. Bailey, who recently resigned the Matson presidency to accept the presidency of the National Federation of American Shipping with headquarters in Washington, D. C. He is one of the most experienced steamship executives in the world.

"We feel that Matson is most fortunate in obtaining the service of Mr. Cushing who will bring to the company a broad experience in every phase of shipping and who is nationally recognized as an authority on the special problems of Pacific Shipping," Mr. Roth said.

His new position will not represent a new association with the Matson Navigation Company. For ten years he was vice president and a member of the Board of Directors of the Oceanic and Oriental Navigation Company, which was jointly organized and managed by Matson and the American-Hawaiian Steamship Company of which latter company Mr. Cushing has been president since 1938. The Oceanic and Oriental Navigation Company operated shipping services to the Orient and to Australia and New Zealand.

A native son of California, Mr. Cushing was born in San Rafael in 1887 and graduated from Stanford University in 1908. He has been with shipping industry since his graduation from Stanford.

At the outbreak of World War I, he was in charge of the New York office of Williams Dimond & Co., and he was one of the first civilians to receive a commission in that war. He served as a Captain in the Quartermasters' Department of the U. S. Army and was later promoted to the rank of Major, in charge of overseas military freight traffic in the New York Port area for the Army transport service, under the U. S. Shipping Control Committee. Following the end of the war he served as director of operations for the Emergency Fleet Corp. under the U. S. Shipping Board. At the end of this service he returned to Williams Dimond & Co. and in 1923 became traffic-manager of the American-Hawaiian Steamship Company. He was elected to the vice presidency of that company in 1925 and to the presidency in 1938.

John E. Cushing, new president of Matson Navigation Company.

During the first year of World War II, Mr. Cushing served as Assistant Deputy Administrator of the U. S. War Shipping Administration with headquarters in Washington, D. C., subsequently becoming Assistant Deputy Administrator in charge of Pacific Area with headquarters in San Francisco. He served in the latter post for the balance of the war, resigning in November 1945 to return to American-Hawaiian. He is an officer of many civic organizations, and is president of the Marine Exchange of San Francisco and a member of the Board of Trustees of Stanford University.

E. Russell Lutz, proposed new president of American President Lines.

E. Russell Lutz is Expected to Succeed Henry F. Grady as President of American President Lines

E Russell Lutz, the man who has actively managed the American President Lines through its recent successful years, now is expected to be its president.

Mr. Lutz was born in Lancaster, Pennsylvania, June 1, 1902, and attended Bethany College, West Virginia, 1918-20. He received his A. B. degree from George Washington University in 1922, an LLB. from Yale University in 1926, and took graduate work at George Washington University in admiralty and foreign law. He was admitted to the bar of the District of Columbia, 1927, and to the Bar of the United States Supreme Court, 1930.

From 1926 to 1937, Mr. Lutz was attached to the State Department, first as Assistant Solicitor and then as Assistant Legal Advisor.

From April, 1937, to October, 1939, he was on the staff of the Legal Division, U. S. Maritime Commission, and from October, 1939, to March, 1941, he was Assistant General Counsel, U. S. Maritime Commission. In the latter position he had a number of special assignments which included Chairman of the Legislative Committee, Chairman, Committee on Admission to Practice, and Chairman, Committee on Conference Procedure. In 1939 he was Special Advisor on Shipping to the United States Delegate at the Panama Neutrality Conference, and in 1940 he was Advisor to the Delegates of the United States, Inter-American Maritime Conference.

In March, 1941, Mr. Lutz joined the staff of American President Lines at San Francisco as Assistant to the President. In 1942 he was elected a member of the company's Board of Directors, and in 1943 he was elected Executive Vice President, and is expected to succeed Henry L. Grady as President on the latter's appointment by President Truman as the first U. S. Ambassador to India.

Mr. Lutz has recently become President of the Pacific American Steamship Association, having served as a Vice President and Director for several years. He is a member of the Pacific Union and Bohemian Clubs.

Dollar Wins in Supreme Court

As multiple changes were taking place in the top executive positions of three major San Francisco steamship companies, word comes from Washington that the Supreme Court by an 8 to 0 decision, put R. Stanley Dollar back in the running for control of the American President Lines. The decision leaves with a trial jury the determination of fact in the long-standing controversy that originated with the transfer of stock control of the Dollar Steamship Company to the Maritime Commission, which changed the name to the American President Lines. The Dollar position is that the transfer was made for the purpose of assuring continuance of operating subsidies and that cash advances to the company have since been repaid out of earnings.

R. Stanley Dollar, president of the Robert Dollar Co. and the Globe Wireless Co.

PLANETARY GEAR FOR MARINE PROPULSION

MUCH ENGINEERING EFFORT has been given by many firms to the problem of saving weight in marine propulsion machinery, particularly in small and medium sized high speed craft. A very interesting and creditable addition to this effort is the development of a heavy duty type bevel planetary reduction gear for commercial vessels by the Western Gear Works. Such units were developed for naval auxiliary craft during the war by Packard for the 1500 hp marine engines used in P. T. boats.

Western Gear Works began the development of their unit in 1942 and completed the manufacture and the testing of the first unit in 1945. In the summer of 1946 they installed a unit aboard the tuna clipper, Sherry Ann, builr by the Western Boat Building Co. of Tacoma, Washington.

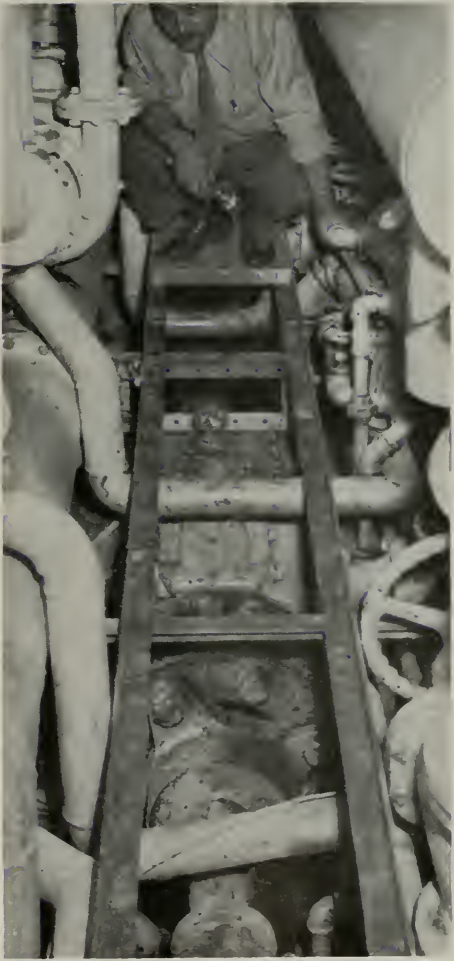
One of the requirements contemplated by the designers of this gear was that it be completely self-contained, self-lubricated and self-cooling, so that it could be placed in the most advantageous position between the engine and the propeller. In the Sherry Ann, this was found to be 45 feet aft of the engine in the shaft alley.

As will be seen in our illustrations, this gear set consists of a helical bevel gear driving a facing identical gear through six helical bevel pinions operating on a rotating spider. This set has a reduction ratio of 2.1, and a continuous torque rating of 228,000 inch pounds. The weight of this complete unit is only 4470 pounds.

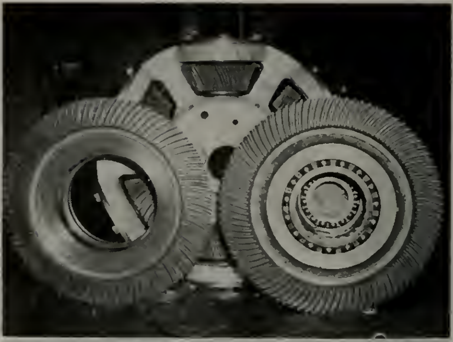
Light weight and compactness of this gear set as compared to the conventional gear set of the same rating is due to the number of pinions, each of which supplies additional tooth contact length. Thus the six pinions in Sherry Ann's gear box provide 18 inch length of tooth contact and the set is equivalent to a conventional helical or herringbone gear set having a 44 inch pitch diameter gear, and a 22 inch pitch diameter pinion, each with 18 inch length of tooth face.

Lubrication is effected by an enclosed pump of the reversible gear type built into the unit and providing spray jet lubrication to the gears and forced feed lubrication to all bearings. Jacket space for cooling water is incorporated. A ball thrust bearing is built into the unit taking all the propulsion thrust.

Between the gear unit and the engine the higher speed


View in shaft alley of Sherry Ann, showing Al Witham inspecting installation of Western Gear planetary reducing set under floor of alley.

▲ The complete unit as installed on Sherry Ann.

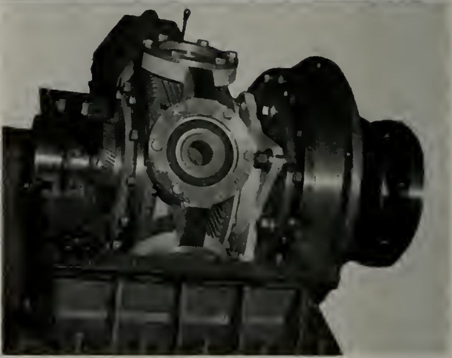


► Upper right: Helical beveled pinions in spider and helical bevel gears unassembled.

shaft and its bearings can be smaller and lighter, thus saving additional weight.

A typical example of the advantage of reduction gearing and particularly the low weight-small space Western Gear planetary type of gearing is shown by taking a 1200 shp diesel engine direct connected and comparing it with a 2-1 reduction geared engine drive.

Direct Drive—	
1200 shp, 300 rpm 16″x20″—6 cyl.	80,000 lbs.
Reduction Gear—	
1200 shp, 600 rpm 12″x15″—8 cyl.	45,500 lbs.
Saving in Engine Weight	34,500 lbs.
Weight Western Bevel Planetary Gear	4,500 lbs.
Net Weight Saving	30,000 lbs.



The assembled gear with top cover removed.

A weight saving of the order of 15 tons is quite important in a tuna clipper. If it can be translated into tuna pay load it means quite a bonus.

INTERCOASTAL RATE DEVELOPMENTS

Gratification over the action of the Interstate Commerce Commission ordering a hearing April 22 on the United States Maritime Commission's petition for an investigation of rail freight rates that compete detrimentally with those of intercoastal water carriers was expressed by Maritime Commission officials. It also was announced that in accordance with the ICC directive that rail and water transportation interests confer on proposed rate adjustments and in accordance with a request of the ICC the Maritime Commission has named George E. Talmage, Jr., chairman of its Domestic Shipping Committee, its representative at the conference.

Mr. Talmage was the first director of the ICC's Bureau of Water Carriers, special assistant to the late Joseph Eastman when he was Director of the Office of Defense Transportation, and during hostilities he was special assistant to Capt. Granville Conway, War Shipping Administrator.

These conferences were suggested by the Maritime Commission recently as a means of hastening solution of the competitive rate problem and Attorney General Clark has ruled that an agreement resulting from such conferences would not constitute violation of the antitrust laws if ordered into effect by the ICC. The ICC has stipulated, however, that no decision arrived at by the carriers at the conferences would be binding in any way on the ICC.

The Santa Cruz, ex - President Johnson reconverted for service between Portugal and South America.

PRESIDENT JOHNSON RECONVERTED FOR PORTUGAL-SOUTH AMERICAN ROUTE

THE GENERAL ENGINEERING AND DRY DOCK CORPORATION of San Francisco recently completed the reconversion of the veteran liner President Johnson from a U. S. Army troop and cargo transport to a combination cabin and steerage passenger and cargo vessel.

The new owners of the vessel, the Tagus Navigation Co., of Lisbon, Portugal, have renamed the vessel the Santa Cruz, and plan to operate her in the Atlantic, between Portugal and South American ports, principally in Brazil and the Argentine.

This gallant old U. S. built ship has had a long and interesting history in the course of her varied career. She was built in 1904 by the New York Shipbuilding Company for the Pacific Mail Steamship Company and known as the Manchuria, operated on the San Francisco-Oriental run until prior to the first world war. Throughout this campaign, she was a troopship in the North Atlantic. In the postwar years she sailed under the flag of the Atlantic Transport Company on their North Atlantic run to European ports. She was acquired by the Dollar Steamship Company, and reconditioned in 1929 at the Newport News yard, at considerable expense. Sailing under her new name, President Johnson, she became well known in the Dollar Line's famous Round-the-World service. She continued as part of the American President Line fleet until the outbreak of the second world war, when she was engaged in transporting troops and war material to all the Pacific war theaters.

Under her new ownership she will carry cargoes and assist in the emigrant trade to South American republics. Few vessels of the type have had such a long, useful, and colorful life, and she remains a remarkable example of that quality workmanship produced in American shipyards.

Her length is 615.5 over-all, with a beam of 65.3 feet, a depth of 23.1 feet, and a deadweight of 14,500 tons. With her two sets of quadruple expansion engines making 9000 ihp and twin screws she has a sea speed of 18 knots.

The specification called for the removal of all armament and defense features throughout the ship and the conversion of troop berthing spaces on Shelter or "B"

A row of Welin nested lifeboats and boom type davits with boat gear complete.

deck for the steerage passengers with all the necessary toilet facilities. Crew's accommodation is also provided at forward end of this deck, and some engineer officer quarters at aft end on the port side. Some third class and 98 women steerage passengers are housed on the starboard side between frames 20 and 77. Steerage dining room for 230 passengers is arranged on the starboard side abreast the engine and boiler casings, and opposite on port side is the galley and bakery. Additional steerage accommodation is located on "C" deck, in three separate tween deck compartments, one for 172 passengers extending from frames 9 to 38; one for 190 passengers from frames 38 to 67; and one adjacent to Hatch 5 forward, between frames 137 and 159 for 184 men steerage. All this steerage accommodation for 1200 persons on "B" and "C" decks could be aptly described as of emigrant type. From bulkhead 159 forward, cargo is carried in three separate tween deck holds.

On the Promenade and "A" decks, the original cabin passenger staterooms used during the war to carry officers and troops are restored to their former condition. These rooms, which are quite spacious and comfortable, will accommodate 134 cabin class passengers.

Especially noteworthy for an old ship was the re-decoration of the spacious public rooms: the Social Hall, Smoking Room, Verandah Tea Room, Dining Room, the suite de luxe and cabin passenger accommodations.

The Social Hall situated on the forward end of the Promenade Deck with outside port holes on three sides, is finished in the French Provincial period, with pale green walls and figured flowered pattern carpet, with salmon colored moire drapery—reds, blues and green prevailing throughout. The furniture is done in antique striped satin, blending in with the color on the walls. A high light of the room is the built-in console, designed with indirect lighting and a large French mirror above. The lighting brackets are all French hand made and four large original Piranesis lend further decoration to the walls.

The Tea Room Verandah on the Boat Deck aft, adjoining the Smoking Room, has large windows on three sides which are treated with drapes of large Hawaiian flowered print in bottle green leaves and coral flowers. It is furnished with very sturdy, specially designed, slatted settees and chairs done in bright colored leatherette. The floor throughout is of hardwood parquet suitable for dances.

The Smoking Room, just forward of the Tea Room Verandah, on the Boat Deck, is done in Old English with oak panelled walls and rubber tiled floor. The furniture includes arm chairs, and corner settees in walnut and genuine green leather with Formica topped poker and cocktail tables scattered around the room. The bar is situated against the forward bulkhead with ample seating capacity and standing room. Window draperies are of Old English linen with dominating colors of green and red.

The cabin dining room, situated on "A" deck forward, extends the full breadth of the vessel with port holes on three sides, and is entered by a stairway from the Promenade Deck which is carpeted all the way to the orchestra platform in the center forward end of the room. The floor is covered in a mottled rubber tile and the draperies are in a turquoise colored woven mohair. All chairs are in natural colored hardwood covered in coral leather, and are arranged with tables cleverly located on each side of the center aisle. This room will dine 146 passengers at a single sitting.

All cabin class staterooms on Promenade and A decks are spacious and cleverly furnished throughout. Those on Promenade have two beds in each with additional Pullman type berth on inboard bulkhead and with intervening shower and toilet for use of passengers in adjacent rooms. The rooms on "A" deck are somewhat larger and have two beds and an additional Pullman type berth in each, with bathroom between serving two rooms. The high light of the entire ship's staterooms is the Suite de Luxe, situated on "A" deck port side and aft of the Dining Room and consists of a sitting room, bedroom and private bath, all furnished throughout in authentic French Provincial theme.

The re-decoration of the vessel was expertly handled by K. H. Lengfeld and Associates, San Francisco interior decorators.

In order to provide sufficient lifeboat accommodation for the increased number of passengers, a re-arrangement of boats and a slight extension of the Boat Deck aft was necessary. Nine of the original boats were retained, eight carrying 50 persons, and one motor boat for 35. Welin Davit and Boat Company supplied an additional 19 galvanized steel boats 26 feet long, each carrying 40 persons. Ten additional sets of boom-type davits for handling nested boats, four of these being the long-arm type and

(Please turn to page 126)

At right: Social Hall looking to Port.

Below, left: Suite De Luxe. The interior decorating follows the French Provincial theme.

Below, right: Main Dining Room (cabin class) looking forward to Port.

At bottom, left: Social Hall on Promenade Deck view looking forward. Decorations in the French Provincial period.

At bottom, right: Smoking Room of Boat Deck. Starboard side looking forward. Decorations in Old English.

California and the American Merchant Marine

By ALBERT W. GATOV, Executive Director, Pacific American Steamship Association

LIKE MANY ANOTHER VETERAN, the shipping industry after the war found itself trying to get back at the same old job. But, like other veterans, it found that the old job was not the same. It faced new problems and changed conditions—problems and conditions it must meet for the sake of its very existence.

The American Merchant Marine today is confronted by many adjustments—adjustments so extensive that they are beyond the scope of the shipping industry itself, adjustments which not only concern our port cities but which by and large affect everyone in this state and the nation as a whole.

Time was when California shipping was centered around our harbors. Port cities were to a great extent the beginning and end of lines of communications. The hinterland consisted of hardly more than the backyard of our harbors. The trade, however, which is the life blood of our present economy came with the thrust of commerce from the interior of the land.

Today more than ever, those arteries of trade, the links with our interior, are the stronghold of the Merchant Marine. The interior of the land will in a large sense furnish the answer to the future of shipping. The coastal cities alone cannot do so; to neglect the inland is to invite extinction.

Thus, there must be stressed at the outset the realization by shipping that its strength lies inland, in the interior of our country which produces the bulk of our goods and where live most of the people whom it must serve.

An Address before a group of California Legislators and the Bay Area Maritime Committee, March 18, 1947.

Fundamentally, and as is certainly the case in this nation, a country's Merchant Marine is an instrument of that country's national policy—that is, its political policy and its economic policy.

As an auxiliary to our armed forces, there is no known substitute for a live and active Merchant Marine. You are all familiar with the stirring contributions of ships to our war efforts. There hardly seems any need to mention in this state, which produced so heavily for ship construction and operations, that the war was finally won when we had enough ships. It was a nip-and-tuck affair until shipping, by the sheer bulk of it, was able to carry enough men and goods for the final drives to victory.

In two great wars, the American Merchant Marine has taken the initial brunt of supporting our armed forces through the first stages.

Without our active merchant fleets in the spring of 1917 and again in the winter of 1941 our progress on the road to victory would have been definitely a slower one. It would have taken precious months to overcome the deficiencies in ships and trained personnel—afloat and ashore—had there not been the basic structure on which to build.

California can be justifiably proud of its conspicuous contribution in the greatest transportation job in the history of the world—the movement by ships of over 200 million tons of cargo and 15 million troops.

Though the first and only industry to be put completely under government control and supervision and the last to be reconverted to peace, shipping does not seek a hero's role. It seeks only to pay its own way in the service of meeting and needs of reconstruction and peace.

Merchant ships are instruments of peace, and the shipping industry has never intended and does not intend now to justify its existence merely as an active auxiliary to our armed forces. By tradition and by its very name it is a tool of commerce and trade. Its mission is to render a service in transportation of passengers and goods. Its contribution to national and world prosperity will be the only yardstick by which its value can be gaged.

Your present merchant fleet, constructed at a cost of approximately 18 billion dollars, is now made up of over 5500 ships totalling 57 million tons and it comprises 60 per cent of the existing world tonnage. This is over four times the number of U. S. flag shipping in existence in 1939.

With all of these ships and all of our shipping experience there is with us the erroneous impression that by mere ship tonnage itself we are the greatest maritime nation in the world. Obviously, our entire war-build fleet cannot be put to practical use. More important, the great bulk of our present fleet consists of emergency type vessels never intended for and substantially unsuited for long-term ventures.

So, our surplus of ships at this time, is, in many respects, a liability. We have a merchant fleet only to the extent that we can absorb vessels in our domestic services and on our foreign routes.

Only the degree of performance on the sea lanes of the world will determine our maritime standing and our ability to serve this country effectively. The volume of cargoes, the size of our passenger lists, the extent of our ships' traffic—these are the criteria by which shipping must ultimately be judged by California and by the shipping industry itself.

Another erroneous impression is that our national economy is quite independent and that, if need be, it can do without imports. Yes, we could exist without imports but we would have to be willing to do without coffee, tea, spices, just to name a few of the imported commodities we are inclined to take for granted. Our cars would be heavy and cumbersome due to the lack of many imported essentials—some 300 products from 56 foreign countries go into new cars. We would, without imports, have inferior soaps, paper, printing ink, paints and numerous articles covering the whole range of consumer goods.

It is true there are probably few industries which could not continue without imports—provided they are not concerned with costs and are willing to change quality or are able to reorganize their manufacturing techniques. In spite of the tremendous technological advances during the war years in the development of synthetics and substitutes, they did not prove to be wholly practicable in many industries. This is confirmed by the response of 234 leading manufacturers in this country in which 75 per cent stated that substitutes for imported materials were unsatisfactory.

One example is the leather and footwear industry. It is little realized that we import at least 62 per cent of our hides and skins and that of the tanning material which we use in producing the quality and utility of our leather over 70 per cent is imported.

A relatively new and important industry for California and the West in general is steel. Yet even steel cannot be produced without manganese which serves to remove impurities from iron ore. Ninety-eight per cent, or almost all, of manganese suitable for metallurgical purposes is imported.

ALBERT
W. GATOV

Other alloys essential to many types of steel are tungsten, of which 55 per cent is obtained abroad; cobalt comes entirely from foreign sources; vanadium is secured overseas to the extent of 60 per cent; 98 per cent of our nickle is bought abroad; all of our tin is imported as is 35 per cent of our zinc.

And speaking about the haulage of our imports, though the average citizen likes to think pridefully of the Stars and Stripes flying from ships in world ports, he also wonders if it is really important. Sometimes he asks whether foreign lines could not carry our cargoes. Of course they could, and they are eager to do so. England is working diligently to regain her supremacy of the seas. Norway, Greece and other traditionally maritime nations are planning strong comebacks. Russia and Brazil, amongst others, are seeking a slice of the world's shipping business. Even Switzerland has a merchant marine.

But the willingness and ability of other nations to carry our goods is no assurance that we will have the service when we need it. It is clear that foreign lines will serve the interests of their own countries first. We have never been able to put full reliance on foreign shipping. In times of political or economical unrest in their own lands, or opportunities of better freights in other routes, they quite logically withdraw their tonnage from routes serving us. We learned this quite dramatically from 1939 to 1941 when we were desperately trying to build up our stocks of raw rubber and tin. We must be thankful for the stockpiles previously acquired and replenished by vessels withdrawn from our domestic routes. Those stockpiles had to be built up by American vessels withdrawn from the domestic services because, when we looked for foreign merchant ships, they weren't there.

So we say again, this nation is not self-sufficient in its natural resources. To be able to off-set these deficiencies we must at least be self-sufficient in the means of transporting them. It is our only safeguard.

On the export side, foreign lines arrange their schedules to meet the demands of their own nationals primarily, and their routes and ports of calls are quite logically designed accordingly. Aside from providing an assurance of shipping service, let's look at what the American Merchant Marine does to promote trade. It's an old saying, but nevertheless equally true today, that "Trade Follows the Flag." Every line has agents and representatives abroad who solicit freight, drum up trade, build up exports and imports, encourage passenger travel, find new markets and assist shippers and receivers in countless ways. These are basic functions in steamshipping, and for that reason they give more direct and dependable service to meet competitive needs of American exporters.

Our exports this year are expected to exceed 11 Billion Dollars, compared with 3½ billion in 1937. Approximately 10 per cent of our national production of movable goods has been destined for foreign lands.

Geographically and economically, California's stake in such development is well defined. It is true that the end of the war brought new problems to California and many of our wartime industries faced the inevitable difficulties to reconversion and adjustments to peacetime conditions. Yet, despite many temporary trade barriers abroad and the job of satisfying an unprecendented domestic demand, California has moved very rapidly into the export picture.

In 1946 California provided and handled 62 per cent of the value of Pacific Coast exports. Translating this into dollars, the daily average moving across California docks outbound amounted to two million dollars. Translating this into terms of employment, it is estimated that 150,000 Californians in industry and agriculture derived their livelihood exclusively from exports. Converting this to average dependents it can be said that close to 400,000 Californians are supported directly by exports.

Speaking of some commodities of direct interest to California, it is important to point out that, prior to the Smoot-Hawley Tariff Act, the U. S. was normally dependent upon foreign markets for the sale of 40 per cent of its dried fruit, 20 per cent of its canned goods, 47 per cent of its borax and from 50 to 60 per cent of its cotton.

And we must not overlook shipping as a direct industrial factor in our State's economy. Not only does it give a livelihood to thousands of seafaring men and to shore personnel, but it provides employment in shipyards and the whole range of interests directly dependent on shipping. A single Pacific Coast line with four passenger and a dozen cargo vessels spent over 30 million dollars in a normal prewar year for wages, supplies, maintenance and repairs.

Fundamentally, the future of our Merchant Marine can be tied to basic trends affecting our entire economy. In the offshore trades it is needless to say that as the nation's world trade policy goes, so will go shipping. Shipping in our foreign routes exists by virtue of the widest exchange of goods. Shipping is a two-way proposition and returning cargoes are as important as our output. Two-way cargoes are an operational necessity. By the same token, there is no one-way street in world trade itself. We need an outlet in world markets for our agricultural and manufactured surpluses, but these outlets can only be sustained on a sound basis by creating foreign purchase power through our own importations. Loans and other forms of emergency pump priming are not the answer, and there is no substitute for the compromise necessary in a realistic world economic policy. Shipping is fearful that the normal channels can be easily choked off by burdensome and short-sighted tariff regulations, the consequences of which would be particularly damaging to the best interests of our State of a whole.

It is earnestly hoped that our experience following World War I will guide us in avoiding after World War II, the mistakes of our Foreign Economic Policy between the two wars when high protectionism contributed to a disastrous world depression and led us to the folly of an isolationist philosophy.

The outlook in the domestic trades, which before the war constituted about two-thirds of the American Merchant Marine, is very dark indeed. The domestic trades were completely obliterated a few short weeks after Pearl Harbor. Since V-J Day they have been operated by the Government, who with complete justification realizes the routes must again be integrated into our National system of transportation.

The Government is operating these vessels at a loss as would be the case were they under private operation. In attempting to solve the problem of getting back to a private operation, the shipowners in the domestic trades find themselves squeezed in a vise. One jaw represents postwar operating expenses and the other, the totally inadequate prewar rate schedules. It is quite obvious that if domestic water transportation is to regain its share of the freight carrying business, the traditional differential between rail and water rates must be preserved. But at the present time rail rates are at a level that precludes any increase in water rates without destroying the differential. Consequently, ship operators are in a position where they cannot look to increased rates as a solution for the high operational cost until there is a general upward revision and adjustment of rail rates. You are, I know, familiar with rate proceedings and appreciate the time it has taken in the past for the various authorities to weigh the many conflicting points which must be presented for consideration.

Financially, many railroads are themselves in poor

(Please turn to page 128)

Air view of Newport Harbor. Note the Beach on the Ocean Front. The difference in color about half way of the width of the beach indicates where the fill from the Bay dredging begins. The outer half of the beach is nearly all filled in area.
(Courtesy Kopec Photo Co.)

NEWPORT BEACH, CALIFORNIA

NEWPORT HARBOR CHAMBER OF COMMERCE · CALIFORNIA

History of Newport Harbor

1542 Cabrillo looked it over
1865 Stern Wheeler Vaquero entered
1890's Ocean beach pier built. Santa Ana-Newport Railroad built.
1888 First Federal Survey of Bay
1906 Newport Beach incorporated
1912 Harbor lines established
1916 Newport Beach voted $125,000.00 for harbor work
1919 Orange County voted $500,000 for harbor work.
1927 Newport Beach voted $500,000
1929 Newport Beach voted $200,000
1933 Government allotted $1,360,000
1933 Newport Beach raised $640,000
1934 First contracts let for modern harbor works
1935-36 Harbor work started and completed.

NEWPORT BAY AND ITS THRIVING CITY of Newport Beach are located in Orange County, California about 45 miles south of Los Angeles. Here is a fine ocean beach and a harbor formed originally by one of the branches of the delta of the Santa Ana river. Here for many years the citizens of Newport Beach (as shown in the thumb nail history herewith) labored to induce Federal assistance and spent much of their own and the county's funds in developing a harbor. Finally in 1933 the Federal aid came through and in 1935-36 a modern harbor was developed. This harbor has since become one of the most popular ports on the Pacific Coast for pleasuse craft and for sport and commercial fishing craft. A large boat building business has been developed and a considerable fish canning business established.

The harbor with its islands and channels is graphically shown in the map and in the aerial photograph reproduced herewith. Work completed in the 1935-36 period provided for:

(a) An entrance channel 3400 feet in length, 500 feet wide and 20 feet deep at mean lower low water;

(b) Main bay channel 14,000 feet in length, 200 feet wide and 20 feet deep;

(c) Turning basin, 32 acres, with a depth of 20 feet;

(d) Yacht Anchorage Basin, 45 acres, with a depth of 15 feet;

(e) The remaining lower bay areas comprising about 385 acres to be dredged to a depth of 10 feet;

(f) West Jetty extension, 675 feet, making a total jetty length of 2830 feet and the repair of the existing old jetty;

(g) East Jetty extension, 950 feet, making a total jetty length of 1673 feet, and stone revetment and protection to existing concrete jetty.

All depths at mean lower low water and in most of the area overdepth dredging of one or two feet was done. Approximately 8,500,000 cubic yards of sand and 50,000 yards of rock were removed.

Except for a few small areas around the bay which were filled in, the greater portion of the dredged material (not rock) was pumped onto the ocean beaches fronting the city, resulting in practically doubling the width of the entire beach area. The City of Newport Beach owns almost all of the entire ocean frontage, about six and a half miles.

On account of the nature of the work, also lack of suitable equipment locally, dredging operations in the entrance channel were carried out by the "San Pablo," a steam hopper dredge, government owned. Sand was pumped into the hold of the dredge, carried out to sea, and deposited in one hundred feet of water.

The jetty work required 210,000 tons of stone which mostly came from Catalina Island. When the work was completed is was found that the cost was considerably below the original estimate.

BOATS USING HARBOR

In 1946 the following craft made Newport Harbor their home port:

Customhouse Numbered Vessels	1429
Documented Vessels	196
Miscellaneous Sailboats, no motor and County registration (MS numbers)	904
Rowboats Registered with Harbor Dept.	1007
Total (by actual count)	3536
Miscellaneous small boats in Harbor, not registered (estimated)	531
	4067

Of the above, about 500 boats are commercial fishing

(*Please turn to page 123*)

NEWPORT, CALIFORNIA

Showing 1935 Improvements

The Pacific Coast Class A Yachts are popular at Newport Harbor.

Air view of Newport Harbor showing the "Snowbird" Race a few minutes after the start. Balboa Island and Harbor Island to the right. Balboa to the left. Ray Island with its beach in front and Lido Isle in the distance.

Late type of Yacht Landing or "Marina" showing intensive use of water frontage.

. . With The Port Engineers . .

J. H. Clark, sales representative of General Engineering and Drydock Corp., presenting on behalf of his associates a handsome anvil and gavel to President Smith and Vice President Deppman of the Society of Port Engineers. The gavel will ring now, eh boys?

AN INTRODUCTION TO COMMERCIAL MARINE RADAR

By WILLIAM U. DENT

Industrial Electronics Representative,

Westinghouse Electric Corporation,

Los Angeles, Calif.

ONE OF THE MOST OUTSTANDING DEVELOPMENTS during the War was that of radar. There was a tremendous variety of radar sets developed for military use, ranging in size from very large high power units with a range of well over 100 miles to very small light weight units intended for operation in airplanes. At the conclusion of the War with the attendant publicity given to radar, it was obvious that radar could be a very important aid in the field of marine navigation. Of the variety of sets that had been developed, the shipborne search type more nearly fitted the requirements for commercial use than did any of the others, however, the differences between military and civil operation dictated several very important changes in this type of equipment.

Military search radar had to be far-sighted in order to detect the enemy as far away from the base as possible. Furthermore, it had to be relatively broad in order to assure that it would not miss a target at the extremely long range. The ability to detect targets close to the ship or base was of secondary importance on the search radar since this area was adequately covered by other types of sets. Military radar was in general quite complicated and as a result it was necessary to have a highly trained crew of operators and maintenance men to use the equipment and keep it in operation.

In commercial equipment on the other hand, the captain of a vessel is only interested in objects that are nearby on the surface of the water or on the adjacent shore line. For this reason a maximum range of from 30 to 40 miles is entirely adequate. The usual navigational instruments will permit arrival at a desired port with an accuracy considerably better than this figure. However, having arrived at the port, the captain will be mainly concerned with objects that may be quite close to the ship, such as channel buoys, ships, small boats, etc. Since navigation in restricted waters is one of the major uses for commercial radar, the equipment must be designed for the shortest practical range and with an accuracy of azimuth and range sufficient for good navigation. The fact that commercial radar will be operated by the usual bridge personnel requires that the equipment be simplified as much as possible with the controls so arranged that it is impossible to damage the equipment or render it inoperative by any adjustment of these controls. The equipment must also be designed for operation over relatively long periods of time without inspection or maintenance since it is rather complicated gear and the average ship's radio operator could hardly be expected to handle this work.

Before going any further in this discussion of radar, I would like to point out that while radar itself is relatively new, the principle behind it is old. The practice of navigating restricted waters, when they are fog bound, by blowing short blasts on the whistle and listening to the echoes is well known. Now radar does exactly the same thing except that it uses a radio echo instead of a sound echo. In using the whistle, it is necessary to use a very short blast in order to hear the echo from a nearby object. The same thing is true in radar, we send our radio energy out in short bursts or pulses. Again with the whistle we must not repeat our blast too rapidly or we will miss the echo returning from a more distant

W. U. Dent, Industrial Electronics representative demonstrating the transmitting half of a radar outfit, H. D. Ross, application engineer. Mr. Ross is contacting the marine clientele heretofore served by Eddie Martin, now Pacific Coast sales manager for Sterling Engine Co.; and H. G. Rethmeyer, marine and aviation manager, Pacific Coast District. All of Westinghouse Electric Corporation.

object, and this same condition is true in radar. Sound, as you know, travels about 1100 feet per second; radio travels approximately 980 feet in one micro-second or in more common terms one millionth of a second. One micro-second is a rather short period of time. However, by electronic means we can measure it with a very high degree of accuracy. For example a radio broadcast station operating at a frequency of 1000 kilocycles, in the middle of the broadcast band, uses exactly one micro-second to send out each cycle of its carrier wave. The Federal Communications Commission requires that this station maintain its frequency with an accuracy of plus or minus 20 cycles which in this case is an accuracy of 20 parts per million. Thus we have immediately the means by which we can measure our micro-seconds quite accurately. However, such accuracy as this is not necessary on a radar set so less complicated equipment is used which will provide the desired accuracy of range which is about 2 per cent.

There is one other basic difference between the principle of operation of the whistle and radar. The whistle radiates sound uniformly in all directions and we determine the direction of any object by noting the direction from which the echo returns. In radar on the other hand we send out our energy in a very narrow beam and when an echo is received, we can obtain the azimuth of the object by noting the position of the antenna at the time. This beam should be relatively narrow in the horizontal direction in order that objects lying close together will show up separately on our indicator, for example a radar beam that is 2° wide will just separate objects that are at the same range but separated by 2°. These same objects will appear as one large object on a radar having a wider beam. In the vertical direction our radar beam must be somewhat wider in order to account for the roll of the ship. About 15° has been chosen for this which will allow for a 7½° roll.

Let us now see in a little more detail something of the equipment involved. I am not going into the details of the equipment since even the language that would have to be used would be foreign to most of you reading this. The usual radar set consists of two major items: the antenna and its associated gear, and the indicator console. The antenna itself consists of a section of a parabola which serves to focus our radar beam into the shape we mentioned above. This antenna is caused to rotate uniformly around a vertical axis approximately twelve times a minute. Thus, in an interval of about five seconds the antenna has scanned the complete area around the ship. For a 2° horizontal beam width on a radar set operating at a radio wave length of three centimeters, the antenna is only a little over four feet across and can therefore be enclosed in a weatherproof housing without having a structure that is excessively large. The antenna structure for a 2° beam with 10 centimeter radar would be almost 12 feet across. For operation where icing may be a problem, this enclosure is advantageous since it can be provided with heaters to prevent any ice formation on the unit. The transmitter which generates the radio frequency power, is usually mounted in the base of the antenna unit although it is possible to mount it separately if conditions require. The power from the transmitter is sent out in pulses whose duration is only about .3 micro-second so that echoes from objects less than 100 yards from the set can be received. These pulses are repeated 1000 times a second which is slow enough to receive echoes from objects 40 miles away and yet is fast enough to practically draw a map on the indicator of objects around the ship. With the antenna revolving once in five seconds and the transmitter sending out 1000 pulses per second it can be seen that there are approximately 5000 pulses of energy sent out during one rotation of the antenna. The radio frequency power in each of the pulses is about 50 kilowatts but the shortness of the pulses is such that less than 1 kilowatt is required from the ship's power lines for the whole radar set. A portion of the receiver is also located in the base of the antenna unit along with the transmitter while the rest of the receiver and the indicator and timing circuits are usually mounted in the console which is located on the navigating bridge or the chart room.

The indicator used is a cathode ray tube which is arranged in such a way that it practically draws a map of objects around the ship with the ship's location always at the center. This arrangement is known as the Plan Position Indicator which for simplicity is usually shortened to PPI. Within this PPI tube there is an electron beam which is normally directed down the center of the tube and strikes the center of the flat circular end which is coated on the inside with a phosphorescent material which emits visible light when an electron beam of sufficient intensity strikes it. This electron beam can be moved from its position at the center of the tube and the rate at which it moves can be accurately controlled. To use this as an indicator, we cause the electron beam to move radially from the center of the tube to the outside edge in exactly the same time it would take our pulse of radio energy to go radially from the antenna to an object at the maximum distance we desired to see and back to the ship again. In case this maximum range is 40 miles, it will take the radio frequency energy approximately 440 micro-seconds to go from the ship to the object and return. So we arrange our electron beam to require 440 micro-seconds to go from the center of the indicator to its outside edge. The echo returning from an object increases the intensity of our electron beam which in turn causes a bright spot on the end of the cathode ray tube. It can therefore be seen that if a bright spot appeared on the face of our tube halfway between the center and the outside edge we would know that an object was located at a distance equal to one-half of our maximum range. By having several different timing circuits or ranges selected by a control on the panel of the console, the operator can adjust the area viewed on the end of the PPI to suit the conditions at the moment. For example one radar set has a maximum range of 40 miles, two intermediate ranges of 16 and 4 miles and a short range of 1½ miles, the latter being of particular advantage in navigating restricted waters. Earlier is was mentioned that the position of our antenna when an echo was received gave us a direct indication of the bearing of the object. By means of a Synchrotie, similar to the gyro repeaters with which you are all familiar, the antenna position can be used to control the angular position of the electron beam on our PPI. The electron beam can be caused to travel a path from the center of the tube to its outside edge, at an angle which is exactly in step with the antenna position. When the antenna is directed dead ahead the electron beam is caused to move from the center to a point on the edge of the PPI at the zero point of the azimuth scale which surrounds the tube. Thus the bearing of any object with respect to the ship's bow can be read from the azimuth circle surrounding our PPI and to aid in making this reading a manual cursor is usually provided. If a true bearing is desired rather than a relative one as indicated above, a gyro repeater mechanism can be included in the console and when this system is in use a bright lubber line on the face of the indicator gives the ship's heading. As an aid in determining the range of an object, marker circles can be shown on the face of the indicator and their intensity can be controlled by a knob on the control panel. These range circles usually divide the distance between the center and the edge of the indicator into three or four equal parts so that the range can be readily estimated. The

Closeup of continuous plan position indicator scope for Westinghouse Marine Radar set. This type of scope, with the ship in the center, provides a continuous picture of ship traffic and shoreline conditions throughout a range of from 100 yards to 32 miles of the vessel.

DOWN BOUND—The 12,500-ton ore carrier, William G. Mather, flagship of the fleet of Cleveland Cliffs Iron Company, enters the Lake Huron end of the St. Clair River on a down bound trip. Navigation of difficult stretches of water encountered between Duluth, Minn., and Lake Erie ports is aided in foggy weather and at night by a Westinghouse Radar set, the antenna of which can be seen on the port side of the pilothouse.

RADOME—Encased in the large weatherproof plastic and metal drum mounted atop the pilothouse of the William G. Mather is the antenna for the Westinghouse Radar set. It is designed to give a full 360-degree horizontal sweep.

brightness of the main image on the indicator as well as the light which illuminates the azimuth scale are also adjustable.

There is one control on the panel of the console which deserves particular mention. This is known as the sea return suppressor. The need for this control can be seen when you realize that waves will reflect the radio beam in much the same manner as solid objects will. However, it has been found that the echoes from waves have a different characteristic from those of solid objects and this difference permits us to reduce their effect on our indicator. For the sake of simplicity in operation, this control usually has three or four fixed positions and it is only necessary for the operator to choose the position that gives him the best and clearest indication on his PPI. This same control is also helpful in clearing up the picture when the ship is in a heavy rain squall or in a heavy fall of soft, wet snow. Fog, light rain and fine dry snow have no effect on the clarity of the indicator while a medium rain may cause a slight fog over the face of the indicator through which the echoes from the surrounding solid objects can be clearly distinguished.

The accompanying photographs show typical views of the PPI as operated under normal conditions. These photographs were taken during an extended test period of the Westinghouse Type MU radar on the William G. Mather, an ore carrier on the Great Lakes.

Examinations For Foreign Service Appointments

The Department of State has announced that examinations will be given over a four day period September 22 through 25 in San Francisco for the Coast, for candidates wishing to obtain appointments as Foreign Service Officers, Class 6. Salary levels range from $3300 to $4400 per annum. The United States had foreign service representatives in every country in the world, and consequently, officers have the opportunity to serve in many posts during their careers.

Application blanks may be procured from the Board of Examiners for the Foreign Service, Department of State, Washington 25, D. C. All applications must be submitted prior to June 30, 1947.

International Comparative Analysis

CARGO VESSELS OF

NATION	BASIC MONTHLY WAGE A.B.	O.S.	Chief Cook	BASIC HOURS (Deck & Engine Room)	OVERTIME RATE PER HOUR	ESTIMATED MONTHLY PAYMENTS INCLUDING OVERTIME & PENALTIES A.B.	O.S.	Chief Cook
United States (West Coast contracts but NMU contracts show only minor variations)	$172.50	$150.00	$205.00	1. In Port: 40 hours per week between 8 AM & 5 PM, Monday through Friday. 2. At Sea: All whose basic work week is 56 hours (watchers) paid overtime above 48 hours.	$1.25 per hour for those paid $200.00 or more per month. $1.00 per hour for others.	$275.00	$240.00	$310.00
						Gross wages as calculated by Maritime Commission plus $10.00 per month for area bonuses.		
Canada	$150.00	$130.00	$180.00	1. In Port: A total of 44 hours per week, 8 hours per day between 8 AM & 5 PM Monday through Friday & Saturday morning. 2. At Sea: 56 hours per week.	80c per hour for First Cook. 70c for A.B. 60c for O.S.	$170.00	$150.00	$200.00
United Kingdom	$ 96.00	$ 80.00	$110.00	1. In Port: A total of 45 hours per week, 8 hours per day between 6 AM & 6 PM Monday through Friday and 5 hours on Saturday morning. 2. At Sea: 56 hours per week.	50c per hour.	$103.00	$ 87.00	$117.00
	$80.00 plus $4.00 for each year up to 4 years. Minimum for veteran A.B.'s $96.00.							
Netherlands	$ 74.00	$ 42.00	$ 93.00	1. In Port: A total of 45 hours per week. 8 hours per day between 6 AM & 6 PM Monday through Friday. Five hours Saturday morning. 2. At Sea: 56 hours per week.	Attempt made to offset overtime with time off. Otherwise payment to A.B. at rate of $0.29 on work days & $0.45 on Sundays.	$ 80.00	$ 48.00	$100.00
France	$ 79.00	......	$ 94.00	1. In Port: 48 hours per week. 2. At Sea: 48 hours per week.	Average of 40c per hour.	$ 92.00	....	$107.00
Greece	$112.00	—	$144.00	1. In Port: A total of 45 hours per week. 8 hours per day between 6 AM & 7 PM, Monday through Friday. Five hours Saturday morning. 2. At Sea: 56 hours per week.	$0.35 per hour.	$117.00	...	$150.00
Yugoslavia	$ 84.00	$ 70.00	$ 89.00		Cook—50c A.B.—48c O.S.—39c	$ 87.00	$ 73.00	$ 92.00
Denmark	$ 85.00	$ 66.00	$ 98.00	1. In Port: Total of 48 hours per week, 8 hours per day between 6 AM & 6 PM. Sunday overtime. 2. At Sea: 56 hours per week.	$0.50 per hour for A.B.	$ 90.00	$ 72.00	$103.00
Sweden	$ 84.00	$ 52.00	$ 95.00	1. In Port: Total of 48 hours per week. 2. At Sea: 56 hours per week.	Rate varies from minimum of $0.25 per hour on work days to $0.50 per hour on holidays.	$105.00	$ 70.00	$115.00

Maritime Wages and Working Conditions—Unlicensed Personnel

10.000 DEADWEIGHT TONS

SUBSISTENCE	SOCIAL CONTRIBUTIONS	PENALTIES	PAID VACATION	AREA BONUSES & MISCELLANEOUS
If food not provided in port, subsistence allowance $3.00 per day. Estimated subsistence on ship costs $1.40 per day per capita.	Merchant seamen covered by State Unemployment and Federal Old-Age & Survivors' Insurance. Health facilities provided by Marine Hospital.	Full range of cargo, stevedoring & work penalties in addition to basic pay.	14 consecutive days after one year of service.	War risk bonus of $2.50 per day in certain areas. Attack bonus of $125.00 per individual in event of serious damage from residual war hazards (mines).
If food not provided by ship, allowance is $2.25 as in contract. Estimated subsistence at sea costs $1.25 per day.	Seamen come with Canadian National Unemployment Insurance. No pension scheme. Hospitalization through Sick Mariners Fund.	Full range of cargo & stevedoring penalties. Some work penalties.	No vacation plan.	No war risk bonuses.
If food not provided in port, allowance is 80c per day. Estimated subsistence on ship at sea is 80c per day.	British seamen covered by national health and pension scheme. $4.00 week unemployed pay plus government benefits.	Very few penalty payments.	2 days leave for each completed month under Articles. Receives only basic monthly pay plus subsistence.	No war risk bonuses.
Not in contract but about $0.80 per day when found by ship. Allowance of $0.67 per day when not found by ship.	Full coverage government retirement, health and unemployment scheme. Includes generous state allowance for dependents. Unemployment compensation extends almost seven months at approximately 80% of base pay.	Practically no penalty payments except $1.90 per month for unlicensed personnel on tankers.	12 working days paid annual leave after 1 year of continuous service.	No war risk bonuses. 10% wage premium for all work outside Netherlands after twelve consecutive months away from home.
Food provided by ship estimated to cost about $0.90 per day.	Special seamen's pension & hospitalization fund managed by Inscription Maritime. Seamen participate in state unemployment scheme. Dependents allowance.	Relatively few penalty payments.	2 days' leave for each month of service. Subsistence also provided.	No war risk bonuses.
Allowance varies with pay but averages less than $1.00 per day.	Complete social coverage, including family allowances. Special occupational pension system.	Cargo bonus of about 10% for petroleum & explosives. Practically no working penalties.	No paid annual leave. In lieu of vacation each seaman receives a six months' bonus of $80.00.	No area risk bonus or other special payments.
Food subsistence at sea estimated at 70c per day.	Workers contribute 7½% of wages for broad coverage. Employers make similar contribution. Includes family allowances based on number of children.	No penalty payments of any importance.	Paid vacation of varying periods with no subsistence allowance.	50% of all income must be contributed as compulsory savings. No area risk bonuses or other special payments.
Food allowance of 70c per day when not found by ship. Reported cost at sea $0.74 per rating.	Broad range of social benefits — health, unemployment & retirement.	Cargo & work penalty payments relatively high for a European nation.	Annual leave of 1 day per month of service with pay and food allowance of 70c per day.	No war risk bonuses.
Food allowance of almost $1.00 per day average when not found by ship.	Broad range of social benefits — health, unemployment & retirement.	Penalty payments relatively high for a European nation.	Annual leave varies but averages one day per month of service plus subsistence.	Area payments only when vessel actually at sea. Amount varies with zones. Certain supplementary payments for continued service in foreign waters.

GREAT SEA RESCUE

CABLE
FROM: HENRY NELSON, MASTER, GEN. GORDON
GMT

Date Sent: March 14, 1947 2225
Date Rec'd: March 14, 1947 445P
SA 95

292 SS GENERAL GORDON MARCH 14, 1947 2225 GMT
PRESLINES
SAN FRANCISCO

FOLLOWING RESCUED SURVIVORS FROM FORWARD SECTION OF SS FORT DEARBORN SAFE ABOARD HERE

RICHARD MAHONEY, CAPTAIN
MILTON E. TAYLOR, CHIEF MATE
RICHARD W. REEP, 2ND MATE
ERNEST D. HENSIGNER, JR., 3RD MATE
ROBERT B. REEP, PURSER
HENRY F. WIEHR, RADIO OPERATOR
LEON C. MOORE, QM/AB
CHARLES BEN, AB
CHENG CHANG MAI, OS
SANFORD D. ROGERS, STEWARD

REGRET ADVISE ARCHIBALD S. SMITH, 3RD MATE, LOST DURING DEARBORN'S ACCIDENT. PLEASE NOTIFY KEYSTONE SHIPPING COMPANY GENERAL AGENTS 1015 CHESTNUT STREET PHILADELPHIA. REQUEST THEY NOTIFY NEXT OF KIN EACH OF THESE MEN. ALL WELL EXCEPT MILTON TAYLOR SUSTAINED BROKEN RIGHT LEG, BUT PROGRESSING SATISFACTORILY. MEN IN FINE SPIRITS, BEING CARED FOR IN SICK BAY AND EAGER GET BACK INTO HARNESS NOTWITHSTANDING ORDEAL. STOP

DEARBORN WAS HOVE TO AND DOING SIXTY REVOLUTIONS WHEN SHE BROKE IN TWO AT 12:15 MARCH 12TH. THEY HAD VISUAL CONTACT WITH STERN SECTION UNTIL 0300 MARCH 13TH. AFTER SECTION REPORTED PROCEDING OWN POWER UNDER ESCORT SS TELFAIR-STOCKTON.

CHRONILOGICALLY RECEIVED DISTRESS MESSAGE 0900 MARCH 12TH, MARCH 13TH 0830 PICKED OUT BOW PORTION DEARBORN ON RADAR 0905 ARRIVED SCENE DERELICT BOW UP BRIDGE PARTIALLY SUBMERGED NOTHING FURTHER VISIBLE.

0927 GORDONS BOAT CAPSIZED IN RESCUE ATTEMPT. HEAVY SEAS. ALL EIGHT MEN RECOVERED. ONE MAN SUSTAINED BROKEN LEG. 1030 SS ST. JOHNS VICTORY ARRIVED SCENE STANDING BY TO ASSIST PENDING MODERATION WEATHER. BOTH SHIPS STANDING BY MARCH 14. OPERATIONS RESUMED AT 0545 WHEN GORDON SPREAD OIL SLICK FURNISHING LEE FOR ST. JOHNS VICTORY MOTOR BOAT WHICH TRANSFERRED ALL SURVIVORS FROM BOW SECTION FORT DEARBORN TO GORDON WHOSE 1337 PASSENGERS AND CREW GAVE BOAT CREW OF ST. JOHNS VICTORY ROUSING CHEERS FOR JOB WELL DONE. COOPERATIVE EFFORTS BOTH SHIPS HIGHLY COMMENDABLE. ST. JOHNS VICTORY LOST ONE BOAT, GORDON TWO BOATS, DURING RESCUE ATTEMPTS.

HENRY NELSON, MASTER

COURAGE . . . SERVICE . . . SACRIFICE . . .

"Next may we express our admiration for the careful planning and skillful execution of the actual rescue operations by the Master, Captain Henry Nelson, to whose experience, judgment and daring beyond all human control . . . First the doctors who gave generously of their limited time to take care of our injuries, nurses who worked long, tirelessly and cheerfully to make us not only comfortable but happy. The Chief Purser and his staff, the Chief Steward and his staff who when we couldn't think of anything more to ask for suggested and provided many additional items and services to add to our comforts and enjoyment."—from report by the rescued.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Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

◄ ALMON E. ROTH, past president of the National Federation of American Shipping.

► FRAZER A. BAILEY, who succeeds Almon Roth as president of the Federation on June 1.

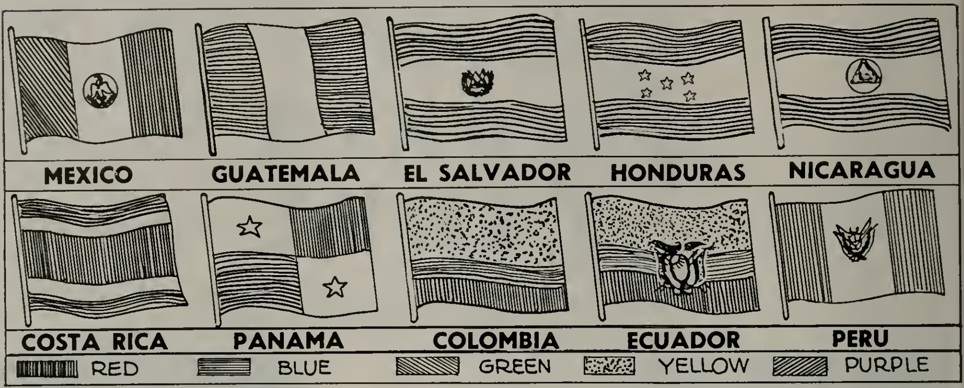
Frazer Bailey Succeeds Almon Roth

The National Federation of American Shipping announces the appointment of Frazer A. Bailey, president of Matson Navigation Co. of San Francisco, as president of the Federation, to succeed Almon E. Roth, who recently resigned the presidency to return to the practice of law in San Francisco.

Mr. Bailey is resigning the presidency of Matson to take up his duties in Washington, June 1. He has had more than 37 years experience in shipping, and prior to his connection with Matson he had four years experience in the shipping industry with the Newport News Shipbuilding & Dry Dock Co., whence Captain Matson drafted him to be his secretary. He was one of the organizers of National Federation of American Shipping, and has served on its Board since its inception.

Mr. Bailey has been an active leader in civic and financial affairs on the Pacific Coast for many years, where he has served as a Director of the S. F. Chamber of Commerce, Director of the American Trust Co., and of the Fireman's Fund Indemnity Company.; Director of the S. F. Employers Council; Director of the Waterfront Employers Assn. of the Pacific Coast, and member of the Advisory Board of the Pacific American Steamship Assn. He is a member of the Bohemian Club, Pacific Union Club, and the S. F. Country Club.

Mr. Bailey will enter upon his duties at a time when the American Merchant Marine is facing many difficult problems. The Directors of the Federation are greatly gratified that they have been able to obtain the services of one who is so eminently qualified by long experience in the field of shipping and in intimate contact with the National Federation of American Shipping, to direct the organization's program.



A Pan American Tour, Flag by Flag

By CARLOS B. LASTRETO

A HISTORY OF FLAGS that have flown over Pan America is very romantic and interesting and includes those carried by discoverers and explorers as Columbus, Cabot and Champlain, by Conquisatadores as Cortez and Pizarro, by trade adventurers as Hudson, the Russian American Co. and the East India Co., and by Libertadores as Bolivar and San Martin. It would tell also of the earliest flags of the colonies of Spain, Portugal, France, England, Holland and Russia, and of the eventually freed nations and the changes and evolution that most of these flags underwent. But the purpose of this paper is limited to a condensed description of the national emblems of today of all the American Republics, of Pan America.

Let us cruise on a friendly expedition to visit our sister Republics and our brother Americans, our Good Neighbors. As we sail out of the Golden Gate and take a farewell glance at our home port over the stern of, let us suppose, the Santa Rosa, the first of our navigating palaces, named for the first American Saint, Santa Rosa de Lima, our emotions are stirred at the sight of her U. S. Ensign with its graceful stripes undulating in the wind and its bright stars of a new constellation that grew to a galaxy and even expanded to include in a widened spirit of confraternity all the Republics that we are to call upon.

MEXICO

A little below San Diego we cross over into Mexican waters and in a few days arrive at Mazatlan. From our anchorage we perceive this "Perla del Pacifico," but almost above our heads, atop of a towering rock, we see the highest lighthouse in the world. Our interest, however, becomes sentimental on beholding the flag of our nearest neighbor. We raise our hats in salute and experience for the first time on our trip our feelings of affectionate friendship swell into one of fraternal love. And this is their flag! Green, white and red in equal vertical divisions, proclaiming the three guarantees of their country, independence, purity of religion, and the fusion of the Spanish with the Aztec elements. The central white is charged with the national coat-of-arms, the eagle perched on a cactus plant and holding in beak and talons a snake, recording the legend of the founding of Mexico City. But for this design, Mexico's flag would be identical with that of Italy, whose ensign, however, bears the arms of Savoy.

Now, already in the tropics, we adapt ourselves to the comforts of hot weather. We continue to sail a long way along the coast of Mexico and across the windy Gulf of Tehuantepec.

GUATEMALA

On shore volcanoes present themselves in numerous company about where we coast off the shores of Central America. First before Guatemala we cast anchor a mile or so from a surf beaten sandy beach on the edge of which a collection of official buildings and a long iron pier make the port of San Jose, the major one on the Pacific side of Guatemala. Behind these rises a panorama of volcanoes including prominently Fuego (fire) and Agua (water).

Quite appropriately, like a gem in the center of a jewel, from atop of the comandancia, shines the flag of Guatemala, blue, white and blue in three equal vertical spaces. While the National and Merchant flag is one, the official government flag bears the coat of arms made distinctive by the beautiful quetzal, a valiant red-breasted green colored bird with graceful tail feathers and whose colors never fade; a bird that never surrenders nor will live in captivity, hence adopted as the country's symbol of freedom and independence.

A railroad starts from the port for the highlands of the interior, where the population is settled in a more temperate climate than that of the hot coast.

EL SALVADOR

We are already and shall be until we reach Ecuador in a zone of intense production of coffee. And as we continue along the coast we know we are off El Salvador when, if by day, we are awed at the sight of Izales emitting preiodically a puff of smoke that mushrooms high above, or, if at night at the fire on its top and often streaks of glowing lava streaming down its side. Legend has given this fiery cone the appellation of "El Faro" (lighthouse) for having opportunely serced unwary mariners.

Our steamer draws into a hill-backed cove in the center of which the country's principal port, La Libertad, opens communication over an iron pier from which authorities come out to meet us at anchor a short way off.

The country's flag flies gracefully from the stern of the Comandante's boat, and we note this to be like Guatemala's blue, white and blue, but, instead of in vertical stripes, the colors are in horizontal bars, and in the white center the words arranged in a circle, "Dios, Union, Libertad."

An interesting short automobile ride through coffee plantations will take us to the Capitol, San Salvador, a pretty and hospitable city worthy of visit. El Salvador is the only North American country that borders only on the Pacific Ocean.

When we are again under way, we are entertained by a series of volcanoes, San Salvador, San Vicente, Usulutan, San Miguel, and we turn with the coast line around Comayagua and suddenly enter the island—crowded Gulf of Fonseca.

HONDURAS

Coincidently that the three Republics, El Salvador, Honduras and Nicaragua abut on this land-locked bay, their respective flags have the same design, three equal horizontal bars in order, blue, white and blue, the original flag of the Federacion Centro Americana, but five blue five-pointed stars on the white center identifies the flag of Honduras.

Steaming through the entrance between islands and the mainland, we arrive at the anchorage off the Island of El Tigre at Honduras, Pacific port of Armapala. The town is picturesquely situated at the foot of the conical island's formation. Over the Cuartel (barracks) we see the flag bears five stars on the white center, that distinguish it from those of Honduras' neighbors.

A launch will take one up an estero (tidal creek) to the mainland whence an automobile will speed you up the highlands to the Capitol, Tegucigalpa. You will appreciate the appropriateness of the country's name when you are in the highlands where you observe vast hollows and depths (honduras) that impress you, instead of mountain elevations as in general.

NICARAGUA

A short way along our voyage we again enter a narrow passage at El Cardon into Corinto's land-locked harbor of Nicaragua and tie up at the wharf before the city which is ribboned along the shore of the estero.

Nicaragua's flag greeted us as we passed military posts on entering and we noted how it is identified with a blue foul anchor on the middle of its center white bar.

On the Pacific slope lie two large lakes, Managua and Nicaragua, utilized for navigation. The country's population is mostly located on their shores and within their basin, and as this is of low elevation, they live in a much hotter climate than do their Central American neighbors, who occupy their highlands.

Carlos B. Lastreto, Long-time foreign trader, world traveler, and noted authority on flags.

Lake Nicaragua has its outlet on the other side into the Caribbean and is the route of a proposed inter-ocean canal.

On our way again down coast our ship goes through a bit of rough weather where winds from the north have rushed through the cut made by those waters through the continental ridge.

COSTA RICA

A bit further on, around Sail Rock, we again steer inwards, now into the Gulf of Nicoya that extends inland far to the north. We can step ashore over the new wharf and stroll the streets of the port city, Puntarenas, all built of cedar wood and covered over by tall cocoanut trees. In a setting of intensely green vegetation and a relucent blue sky, Costa Rica's flag awakens a lively admiration by its brilliant tricolor groupings in horizontal stripes of blue at top and bottom, then equal to these in width and inside of them two white ones that in turn contain a double wide red stripe along the middle.

The government's official flag bears the national coat of arms as a badge on the red center.

While Nicaragua was the first Central American country to operate steam navigation to the Caribbean Sea via its lakes and the San Juan River (route of a proposed canal), Costa Rica was the first to establish rail communication from its central populated region to its port on the east coast at Puerto Limon.

PANAMA

Our good ship cleaves through placid waters around under the bottom of the northern part of the American Continent and heads directly north into the Gulf of Panama toward the historic isthmus. We slide between picturesque islands in the bay, islands that in pre-canal days sheltered the terminal anchorages of the vessels that engaged in inter-oceanic transportation. Finally, we moor at La Boca (the mouth of the canal) the Balboa of the Canal Zone, at one of the wharves just at the canal's entrance.

As this is in the Zone, our own Stars and Stripes proclaims its authority from the hilltop Administration Building, but when our taxi takes us a bit farther we are in Panama proper, and the flag that in 1903 displaced that of Colombia now bids us welcome; the flag that, though "provisionally" adopted in June 1904, still gallantly serves, is quartered, the first and the fourth quadrangle white each with a five pointed star respectively blue and red; and the second plain red and the third plain blue; the blue for the Partido Conservados and the red for the Liberal.

From the days of the Conquisradores to those of the California gold rush and on, this strip of the continental divide, that separated the oceans, paradoxically connected them for the great movements from Europe to the Pacific side of the American Continent, whither most of the earlier settlements went.

And Panama's historical importance includes also the first inter-American congress summoned by Simon Bolivar.

COLOMBIA

Again through the island spangled gulf, but now southward, and past the Pearl Islands beyond, we sight for the first time the South American Continent at the coast of Colombia, incidentally the only South American country with a strand on both the Western and the Eastern seas. Even so are the colors of her flag the same and of the same origin as are those of its Pacific Ocean neighbor, Ecuador, and of its other sister at birth, Venezuela, on the Atlantic side.

The flag was born at sea in 1806 on the "Leander," which had sailed from the United States on a revolutionary expedition under the Venezuelan "Precursor," Miranda, who designed it and was carried by the "Libertador," Bolivar. However, many other flags waved in the fights for independence, even as happened in our English Colonies. These three peoples fought together, so it is fitting that they retain between themselves the same colors which are horizontally, yellow, red and blue, rainbow colors which have given to it the epithet of the Iris Flag.

This is the first yellow we have seen in our flags, and it is the only one that borrowed this color from that of the same mother country of nearly all of them. The blue really means to represent the seas that separate the new nations from their mother country. More facetiously it is storied that the yellow proclaims hat the golden shores of Nueva Granada are separated by the blue seas from the bloody land of Spain.

Our steamer penetrates the coastal manglares up a broad estero to the foot of the majestic western flanges of the Andes and moors at the wharf of Buenaventura. Then we note that the yellow occupies the full upper half of the flag, while each of the blue and the red stripes is of half that width. And additionally we distinguish on the merchant flag a vertical oval blue badge bordered with red and with an eight pointed star in the center.

ECUADOR

Resuming our voyage southward we cross the equator off Ecuador and strangely experience cooler weather along these shores. This phenomenon, prevailing to Chile, is caused by the Antarctic cold Humboldt current that flows up the coast. But when we enter the Guayas River steaming inland from the Ocean, we are soon reassured of being in the Tropics. Up some 35 miles we anchor in the stream off Guayaquil, the country's principal port. On either bank we have observed jungle and plantations of cocoa and coffee and on shore we shall unfailingly procure a "sombrero de pita," misnamed Panama hat. As we learned in Colombia, the flag of Ecuador is the same, except that here the national and merchant flag bears no badge.

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PERU

Again steaming down the coast, we come off Peru and stop as Callao, the principal port and one of the oldest historical cities in America. Less than ten miles inland is Lima, the capital, at the foot of the Andes. We should at least take this short trip of less than ten miles to this beautiful and historically romantic city, once the capital of all Spanish South America, and repository, in its Cathedral, of the remains of the "Conquistador," Pizarro.

Californians may be proud that it was one of them, Harry Meiggs, that first conquered the defying Andes with the iron horse, the feat a profanation of Nature's apparent plan that the Cordillera be impassible. This is the Oroya R. R., and it attains the highest elevation of any passenger line in the world, 15,750 feet in Meiggs Tunnel.

The Granadian "Libertador," Simon Bolivar, the Argentinan "Protector," San Martin, and the Bolivian patriot, Sucre, met in Peru in the final throes of their struggle for independence from the same mother country. And it was San Martin who saw, in the sky, birds of august flight and of inspiring beauty with white breasts and red under the wings. It is these colors that, after some alterations in arrangement, make up Peru's national flag; a white vertical pale or stripe down the center between two equal red ones.

BOLIVIA

The coastal belt is becoming narrower and in long stretches, rainless and barren. But we have an interest in what is over the towering mountains. So from the Peruvian port of Mollendo we undertake to scale those ramparts on another road built by Harry Meiggs, for we must visit our sister Republic, Bolivia, perched high up there away from the coast. And this will not make an exception in our arrivals by water on a steamer for we embark on one where we leave the train still in Peru at Puno, to navigate Lake Titicaca and arrive in Boliva at the port of Guapi. And we see the flag of Boliva engaged in international trade on Lake Titicaca, 12,600 feet above the seas, than which no other ensign in the world flies higher.

From this port of debarcation a short train ride brings us to the capital metropolis, La Paz, where we learn that the three horizontal bars, red, yellow and green, of Bolivia's flag typify respectively animal life, the mineral kingdom and the vegetable world.

CHILE

We may leave Bolivia for the sea coast by other rail routes, as the one to Arica on the nitrate coast of Chile. On shore here, rainless and barren, we pass many cities which have begun to be well-known "nitrate ports," nearly all open roadsteads, and shipping is noticeably more numerous, so we repeatedly observe the brilliant Flag of Chile, "La Estrella Solitaria." The Flag's lower half is red and the upper half is white, except for the square blue canton at the hoist, charged with a white five-pointed star. The resulting similarity to the Stars and Stripes and the fact that during Chile's fight for independence the Flag of the United States was honored by special display at a commemoration of the 4th of July, has suggested to some writers the probability that a confraternity of spirit inspired the similitude.

For our visit we stop at Valparaiso. This is the port of the Capital Santiago, 115 miles nearer the massive Andes topped

Pacific WORLD TRADE

by snow-capped peaks. The port city appears to be two-storied, much of the residential section being atop a high shelf behind the business district along the shore.

Here again we learn of Harry Meiggs' genius in overcoming an engineering difficulty in the location of the railway between the port and the capital. The coast line as observed from deck now indicates the agricultural fertility of southern Chile. Passing more ports to the south, as we proceed to round the tip of the continent, we pass also the southernmost city of the hemisphere, Punta Arenas, now Magallanes, on the Strait of this name, which takes us out to the other side of the continent onto the Atlantic Ocean.

ARGENTINA

Having steamed northeasterly over 20° of latitude, we enter the famous Rio de la Plata and call at Buenos Aires, the Paris of America and capital of Argentina, the land of stock ranges.

Two particulars engage our minds at first sight of Argentina's flag. One is its similarity to the flag of Salvador, Honduras and Nicaragua, with equal horizontal blue, white, blue stripes, and the other is the golden sun emblazoned thereon, as well as on the flag of its neighbor, Uruguay. The Libertador, Belgrano, designed Argentina's flag, and San Martin carried it in his campaigns, but the choice of the blue antedates the fight for independence from Spain for it was the color of the material available for the cockades of those that repulsed an aggressive attempt by the British a few years before. The other is that of golden sun with straight rays of light and wavy ones of heat emblazoned on the middle white bar. The sun, god of the Incas of Ecuador, Peru and Bolivia, might have been charged on the flags and the arms of the Andean countries, but it was not. But, and in no relation thereto, the sun on the flags (and on the arms) of Argentina, and also of Uruguay, its neighbor and confederate in their early strifes, is the rising sun of the day of independence, El Sol de Mayo, The Sun of May, the month in which the fight for independence began.

In the port of Buenos Aires we may view the greatest assemblage and variety in America of the merchant flags of the nations of the world floating from the masts of the visiting foreign shipping.

After a delightful sojourn admiring the beauties of Argentina's capital, Buenos Aires, "City of Good Air," meaning climate, we resume our voyage for land-locked Paraguay.

URUGUAY

Our steamer will be awaiting us at Montevideo in Uruguay on the north side, the left bank of the mouth of the Rio de la Plata. And we visit this beautiful city of a peaceful industrious, cultured people.

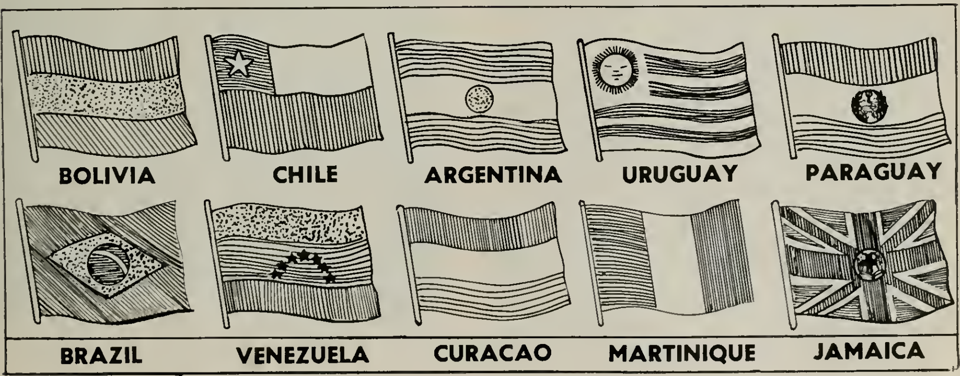
Their flag, after several evolutions, now bears nine equal horizontal bars, alternating with five blue and four white, but with a white canton emblazoned by the same golden sun, the Sol de Mayo, as of Argentina, for these two peoples earned independence together.

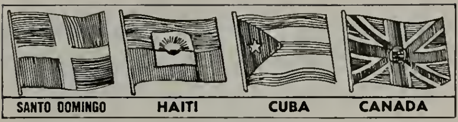
After having steamed out of port Montevideo, if we coast near enough we shall admire a close succession of suburban homes within artistic gardens and many close to the perfect bathing beach, evidencing opulence and comfortable happy home life.

PARAGUAY

Further into or up the Rio de la Plata we enter and ascend the Parana, then the Paraguay River to Asuncion, capital of Paraguay. Opposite this port and capital, the Pilcomayo comes from the west, and the high Bolivian plateaux, but unfortunately does not afford navigable access thereto; thus Paraguay is in this respect the more fortunate of these two countries land-locked from the sea. Our steamer has drawn alongside the quay on the river bank. It is here that most of Paraguay's international traffic is handled, though there are other ports on this and the Paraguay River with rail facilities therefrom.

Paraguay's Flag has its interesting features. For one thing, its colors and their arrangement are exactly those of the Flags of the Netherlands and of Luxemburg, that is, red, white and blue in this order in equal horizontal stripes. But as distinguishing emblems, the national Flag and ensign has a different badge on each side, both placed in the center of the middle white bar. The merchant flag has a badge of still a different design, this one placed near the hoist. And, that you may not suppose that this strandless, riparian state has foregone the ocean wave, be it known that it has a full set of distinctive flags for each of the Ministers of Marine, the Admirals of several ranks, Commodores, Captains, Flotilla Commanders and Senior and Junior Naval Officers. May we have occasion to hear of the prowess of the Armada that exists at least in an abundant series of personal naval ensigns.





After an interesting visit in this agricultural and wood products country we may return to the sea coast by steamer or rail.

BRAZIL

Ere this we shall have observed a different firmament overhead on clear nights and experienced emotion in contemplating the Southern Cross as it rotates around the Antarctic Pole with the passing hours. Such is the influence that it has effected, that three southern hemisphere countries portray this cluster of the Crux Australis on their flags; New Zealand, with four stars, Australia with five, and Brazil that sets it amongst other surrounding stars to count twenty-one in all, to typify the states and the Federal District. These are placed in a blue celestial sphere with a white band along the ecliptic that blazons the motto "ordem e Progresso." This blue sphere is borne within a yellow diamond which in turn lies on the green field of the flag. In the pre-Republican era, when Brazil was an empire, the flag was also green with the yellow (for gold) diamond, hence both are popularly called the "Auriverde," though derived from the same Portuguese colors.

On this part of our voyage we have sailed a long way northeasterly along but a part of the coast of Brazil, the largest country of Pan America. We may call at Santos, the greatest coffee exporting port in the world. On a little further we cross the Tropic of Capricorn and again into the Tropics and enter the port of Rio de Janeiro. Surveying from the deck of our steamer we are impressed at the sight of the famous "Pao de Assucar" (Sugar Loaf), around which we turn and behold the Corcovado Peak, and between both the beautiful Capital of the republic and the most magnificent harbor in the world. And accompanying our admiration is our recollection how Brazil has been outstandingly our loyal friend.

We proceed up the coast to steer around the easternmost projection where our continent is nearest to the Eastern Hemisphere off Africa and thence the jumping-off place for transatlantic flight.

So we change our course northwestward to our last continental neighbor, Venezuela.

VENEZUELA

In following the coast on further we change our course northwestward on to our last continental neighbor, Venezuela. Our good ship moors to a wharf of the principal port, La Guayra, which is huddled on a narrow beach at the foot of the high tablelands, on which nearby and 3,000 feet above, is the Capital, Caracas.

At sight of Venezuela's flag we are reminded of the Iris flags of which this is one, but variant from the other two, the flags of Colombia and of Ecuador in this, that its three horizontal bars, yellow, blue and red, are of equal widths; furthermore it bears seven white stars on the central blue.

Most of Venezuela's enormous production of asphalt and oil is refined on the Dutch Island of Curacao.

CURACAO, MARTINIQUE AND JAMAICA

On resuming our voyage northward we leave the South American continent and we pass the Netherlands Island of Curacao, whose land-locked harbor (Willemstad) is opened and closed by a floating bridge-gate. Though she is not of Pan America, yet as she is one of the United Nations we salute the flag of the Netherlands, our ally and important contributor of refined oils. Then we note that the flag is similar to the one we met in Paraguay, with horizontal stripes of red, white and blue.

So now we are in the Caribbean which is occupied by more friends and allies other than Pan-America neighbors. For off beyond the eastern horizons flies the tricolor of France (vertically blue, white and red) on Guadalupe and Martinique, presently our naval bases.

Also later we shall steer behind Jamaica, whose garrison at Kingston displays the British Grand Union Flag of three superimposed crosses.

SANTO DOMINGO—HAITI

But to call on our next American Neighbor among the West Indies, we drop in at Santo Domingo where is the first permanent European settlement island of Santo Domingo, first called Hispaniola by Columbus. It contains the two Republics of Haiti and of Santo Domingo. And the history of this Island records the only American territory that underwent several subjections. The Island was first held as a colony by Spain, then ceded to France. The British occupied the Island for awhile and after the French re-established control the islanders drove them away and attained independence and finally established two republics independent of each other.

Santo Domingo made hers the flag of the party that gained the Island's independence, "La Trinitaria." It is the only American flag with a cross. This broad white ordinary reaches to the four borders and creates four cantons, the first and the fourth blue, and the second and third red.

From one port, Santo Domingo, capital of the country of the same name, we go to another port, Port au Prince, capital of Haiti.

Haiti co-occupies the same Island at the western end. The populations of both countries is negro, but Haiti is the only French language member of Pan America, and she enjoys the distinction of being the first country to proscribe slavery. Her flag colors derived from the time of her French rule and after several changes in position, now remain blue over red in equal horizontal quadrangles, the white of the central stripe of France having been significantly eliminated with the termination of friendship in the struggle for emancipation.

CUBA

From Santo Domingo, the oldest European settlement in the Western Hemisphere, and Haiti, the first country to follow the United States in the attainment of national independence, we cross the Windward Passage of Cuba, Island, and the last of our Good Neighbors to raise her own flag of freedom.

Mario Lopez, who had been deeply moved by the fight of the Texans for separation from Mexico, mustered some hundreds of American veterans of the Mexican Wars, and in 1850 sailed from the United States to liberate Cuba from Spain, though himself a Venezuelan. His obsession was also his inspiration to adopt the Texas Lone Star of its flag as the chief emblem of his standard, and the Estrella Solitaria has continued to be Cuba's flag of its several rebellions and finally of its achieved nationality. Thus a star is borne in white on a red equilateral triangle based at the hoist, the rest of the flag being alternate three blue and two white horizontal bars.

The Capital city of Havana faces both the sea and its enclosed harbor. To starboard, on the seashore before the city stands the monument that bids us "Remember the Maine." Then as our ship steers through the narrow entrance into the bay, on the port side, Morro Castle towering atop an eminence awes the visitors to this island of sugar and the best tobacco. On departing we salute on El Morro's staff the proud bright flag of the twenty-second and last of the visited American Good Neighbors.

CANADA

Now again into temperate waters past the eastern front of our country we shall complete our pilgrimage at Halifax, the Naval Station of Canada, our ally and new accession to the all-inclusive Pan-America.

Canada raises the British Union on shore as its Dominion Flag and at sea its merchant vessels wear the Red Ensign with the Canadian Shield of Arms as the badge of its flag.

The Junior World Trade Association of San Francisco

At its March meeting the call for explanation of the Sea-Air controversy, which has been under discussion in shipping circles for years, was answered by Jim Black of the Matson Navigation Company. His address is published herewith for the benefit of those who could not attend.

Introduced at the meeting by President Stewart was Herbert G. Porter of Otis, McAllister and Co., representative of the Association at the International Trade Organization Charter hearings at San Francisco.

World Trade and Sea-Air Operations

By JAMES B. BLACK, Jr.

FOR THE PURPOSE OF MUTUAL UNDERSTANDING, let's go back a bit—to some of the fundamentals of foreign trade. Let's assume foreign trade consists not of ships or airplanes—but of the transportation of cargoes and people.

It is true that in the hundreds of years that nations have been trading with each other, the ship has been the principal medium of foreign trade.

Somebody in one country sold something to someone else in another country— a ship was employed to carry it—the man who bought it liked it—the man who sold it made some money—the transaction was repeated, often, many times— this business attracted other business—more ships were required—eventually a shipowner placed a number of ships permanently in a particular trade—and a trade route was born. Hundreds of years of transportation history are replete with such stories of how shipping trade routes began, sometimes died out, but more often were added to and expanded as trade increased.

John Stewart, president, Junior World Trade Association, and James Black, Jr., speaker at the meeting.

But, if any government at the outset had handicapped development of any individual operator, the original transaction might never have been consumated and the trade route never developed.

It should be emphasized that this concept is neither peculiarly of the sea nor the air—it is applicable to any part of the steady growth of our essential foreign trade that has been going on for centuries—camel caravans, Spanish galleons, the great American clipper ships, the early side wheel packets and the modern turbine steamers. Today we have the reciprocating engine airplane, tomorrow we shall see the turbo jet and rocket type of air transportation. Who can predict what lies beyond that? All of these are merely the increasingly efficient arteries through which our foreign commerce flows.

The mere fact that the airplane is now added as a means of international transportation does not change the essential picture—we are still carrying people and things from one country to another.

To have stopped at any point in this development in rapt admiration of some particularly striking advance in the transportation vehicle of that day would have been just as disastrous to the continuing development of our foreign trade then as it would be now.

It is general knowledge that in this postwar period the principal countries of the world are engaged in a gigantic struggle to obtain and hold on to their portion of world trade.

At the moment America has the advantage.

To hamper in any way the American initiative in developing our foreign trade both by sea and by air would only give our foreign competitors an unfair advantage in the trade war that is upon us. You will agree that it would be a tragic error for our country unilaterally to take the lead in preventing our carriers from freely participating in the development of commerce in the international field. Of course, if other countries in exercising their sovereign rights decide to keep us out, that is another matter— but let us not take the initiative in any such restrictive policy. We have so much more to lose. Not only would it deprive American manufacturers—merchants—and farmers from the quickest means to their foreign markets, but also it would prevent free American capital and enterprise from developing new markets in foreign countries—all to the ultimate benefit of our American economy.

Today there are eleven principal American Flag steamship companies interested in establishing their legal right to operate scheduled air service over the ocean routes they pioneered and developed. These companies are the:

Herbert G. Porter, of Otis, McAllister & Co., who presented a noteworthy argument at the International Trade Organization Charter hearings in San Francisco on behalf of the Junior World Trade Association.

American President Lines; American South African Lines; Atlantic Gulf and West Indies Steamship Lines; Grace Line; Matson Navigation Company; Moore-McCormack Lines; Oceanic Steamship Company; Seas Shipping Company; United Fruit Company; United States Lines; Waterman Steamship Corporation.

Some of these lines have sought air certificates from the Civil Aeronautics Board—none has been granted.

These 11 American steamship companies, do not propose to acquire any existing air service. They seek only to provide new services with new equipment and in their own corporate names.

They do not plan to invade the territory of any other American interest. They ask only the right to provide a complete transportation service over their own traditional routes, serving their regular trade areas and patrons.

They do not ask exclusive rights to provide air service —even over the routes they have pioneered. They subscribe to the principle of regulated competition as defined in the Civil Aeronautics Act of 1938. They are opposed to granting a small group of airline companies a monopoly of America's overseas transportation companies.

They do not contend that the fact that they have carried the American flag over these routes in the past, and have developed both cargo and passenger business in their trade areas over many years, automatically entitles them to air certificates.

They do contend that they are entitled to equal consideration along with other applicants who now seek for the first time to enter the overseas field and who would bar all shipping companies from providing air transportation supplementing their surface transportation.

Each of the 11 shipping companies stands ready to meet any and all tests required of other applicants by the Civil Aeronautics Board.

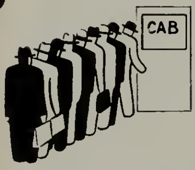
Contrary to statements sometimes made, there is no policy of Congress against shipping company operation of aircraft. On the other hand specific provision is made for such operation in the Merchant Marine Act of 1936 and the Civil Aeronautics Act of 1938.

The 1936 Act directs the Maritime Commission "to

(Please turn to page 120)

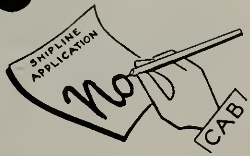
U. S. Shiplines Fettered by C.A.B. While Foreigners Get O.K.

1



Nine U.S. shipping companies have made applications to the Civil Aeronautics Board...

2

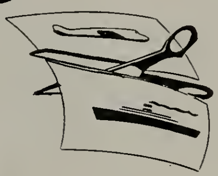


But the C.A.B. has not approved any application by a U.S. shipping company...

3

...And the one company which had a temporary war-time certificate was forced by C.A.B.—after millions of miles of successful operation—to divest itself of its airline holdings.

4



So, today, the C.A.B. artificially divorces the natural partnership of SEA and AIR for U.S. companies—while, by international agreement, it is in effect forced to grant this privilege to foreigners.

Marine Insurance

Our London Letter

By Our United Kingdom Correspondent

The International Shipping Conference

WHILE THE BANNING FROM MEMBERSHIP of Government organizations was the most significant feature of the recent International Shipping Conference, held in London, there were some important marine insurance "pointers" under the heading of "Technical Matters." Briefly, it may be recalled that the Conference was established in 1921 after the first World War, following consultation with one or two of the leading shipowners' organizations on the Continent. The first Conference devoted itself mainly to revising the whole of the safety regulations in such a way as to incorporate the war experience in these matters in a series of recommendations which subsequently became the basis of the revised Conventions on Load Line and safety of Ships at Sea.

The next meeting was held in 1924, and, besides carrying the work on safety regulations a step further, they dealt with a number of subjects such as the Hague Rules, general average, flag discrimination, uniform tonnage measurement, double taxation, sanitary regulations, immunity of public ships, and other matters. The third Conference was held in 1926, and dealt further with most of the above subjects and also with such matters as oil tanker freeboard, oil discharge, collision regulations, clean bills of lading, mortgages and liens, etc. The fourth Conference was held in 1928, when the progress in regard to the subjects mentioned above was reviewed.

The International Shipping Conference has been represenred at a number of Governmental International Conferences, including those of the League of Nations dealing with the Maritime Ports Convention and other matters affecting shipping, the Wireless Conferences, Safety and Load Line Conventions, the World Economic Conferences of 1928 and 1933.

The International Shipping Conference has never concerned itself with Liner Conference affairs such as Liner Conference rates of freight, etc., and its activities have been mainly directed to questions of policy affecting all sections of the industry in greater or lesser degree, though the passenger lines were alone concerned with the problem of subdivision of passenger vessels as part of the safety regulations.

At the latest (mid-February, 1947) Conference, in London, the Conference considered "technical matters," in particular the review of safety conventions and the provision of wireless wave bands. With regard to the first, the Conference recalled the acrion taken by it in 1921 to initiate a review of safety requirements after the 1914-1918 war, which provided the basis for the revision of the International Convention on Safety of Life at Sea in 1929 and the International Load Line Convention in 1930; pledged its furrher co-operation with the Maritime Governments in any further revision of these Conventions, and urged that sufficient time should be allowed before calling the Safety Conference to permit of full consultation with the International Shipping Conference; and with that object authorized the appointment as appropriate of committees to examine and make recommendations on the various aspects of the safety problem in the light of recent preliminary discussions.

All such proceedings are of the greatest importance to marine insurance people the world over, so that the following resolution which the Conference unanimously carried with regard to wireless is of supreme interest:—

> "The International Shipping Conference once more calls attention to the absolute necessity, in the interests of safety of life at sea and efficient communications, for the reservation and allocation of adequate wireless wave bands for marine purposes; requests that all Governments will unite to ensure this object at the forthcoming International Telecommunications Conference in May, 1947; approves the action taken to secure the representation of the International Shipping Conference at that Conference; and authorizes the appointment of an expert committee to prepare the industry's case to that Conference on the basis of data available and to be supplied."

Finally, it is of interest to note that it was agreed not to allow too long a period to elapse between meetings of the Conference, a tentative suggestion being advanced that the Spring of 1948 might be regarded as a possible date for the assembly of the next Conference.

Mines in Scandinavian Waters

Better conditions are expected this summer in regard to the mine position in Scandinavian waters. The Liverpool Underwriters' Association, one of the leading marine insurance organizations in the United Kingdom, in its annual report published earlier in 1947, made what has proved to be the optimistic remark that Danish and

Swedish territorial and neighboring waters were said to be practically free from mines, although it was admitted that occasional drifting mines would still constitute a danger.

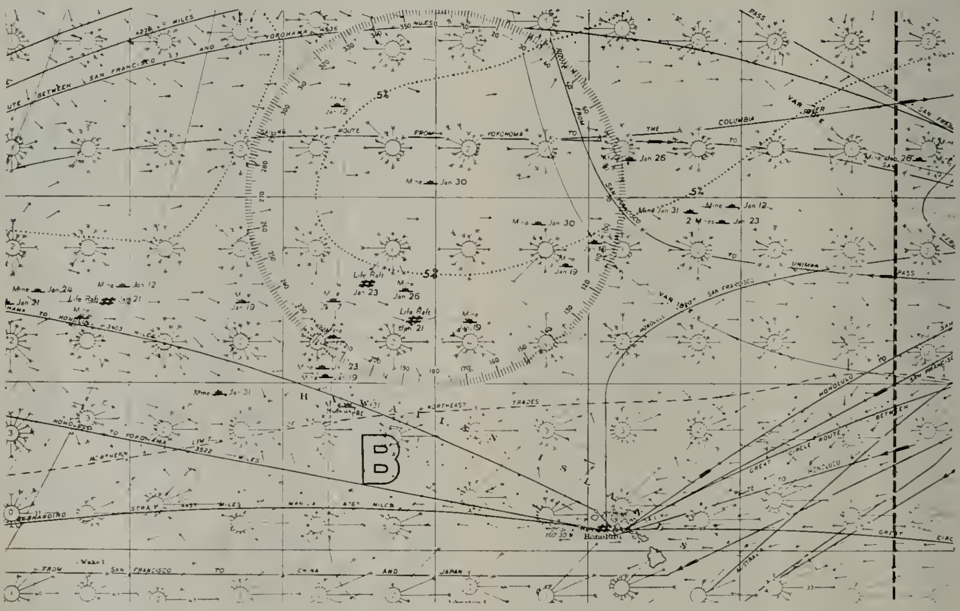
Now comes news from an authoritive Danish source, which makes it clear that there are still thousands of magnetic and acoustic mines in the waters in question, despite extensive minesweeping. The swept routes should be safe, but the fairways are narrow and ice conditions have resulted in the displacement of certain leading marks, such as buoys light vessels, etc., so that the fairways may be difficult to follow, especially in bad weather, fog and the hours of darkness.

Last year more than 20 vessels were damaged by mines round the Danish coast, and recently the large tanker "British Earl" was badly damaged by a mine in the Great Belt. During the recent war, Germany laid about 13,500 mines in Scandinavian waters, to which must be added about 4,000 magnetic and acoustic mines laid by the United Nations.

Since the cessation of hostilities, German minesweepers have sailed 108,700 miles, but all they got were 32 bottom mines and 31 anchored mines. This is a poor result, but it is probably accounted for by the fact that sweeping operations were concentrated upon the more important routes and that there are many mines outside these routes. Theoretically, the sweeping operations in the Skagerrak should have yielded about 1400 mines, whereas only 31 were swept. One reason for this is that the anchor ropes of moored mines break and the mines go adrift, many of them stranding. About 4000 have, in fact, stranded on the North Jutland coast. Drifting mines are not really a great danger; the bow wave of a vessel travelling at any speed usually washes them aside and they do not strike the hull.

All the mine casualties to ships in Danish waters have been caused by bottom mines, magnetic and acoustic. Better conditions may be expected this summer. As soon as ice conditions permit, 60 German minesweepers, in co-operation with, and under the supervision of, a fleet of about 50 Danish sweepers, will resume operations, and, with the main channels already swept, more outlying waters can be dealt with. Nevertheless, Danish underwriters still consider the mine risk around the Danish coast to be serious.

Reasons for Marine Insurance



This is a small section of a chart issued regularly by the U. S. Hydrographic office to the masters of all ships. It shows, in addition to wind and storm trends, the location of obstacles that menace navigation. The chart shows the mid-Pacific area, with Honolulu in the lower right. Note the floating mines, logs, derelicts, life rafts and other obstacles in the ship lanes. There will be thousands of such obstacles for years to come, if experience after the last war is any guide.

Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

Employees' Patent Rights During Employment

I SUPPOSE FROM THE BEGINNING OF TIME employers and employees as well have made complaints about the other on the basis of the claim that either the employee invented a particular device or piece of equipment that the employer subsequently adopted as his own or, on the other hand, the employer claims that the employee, during the course of his employment, adopted a device or an idea that came to him either as a result of his employment or as a result of some act of the employer, thereafter claiming ownership of the idea or right of whatsoever nature it might be. The cases are numerous. However, in the field of Admiralty they are rather limited and the recent case of *Matarese vs. Moore-McCormack Lines, et al,* C.C.A. 2nd, presents a situation where an employee attempts to secure compensation for a production of his imagination that was put into practice by his employer. The action resulted in judgment for the plaintiff by jury verdict in the sum of $90,000, which was subsequently reduced to $40,000. The appeal raises the issue whether a corporation may be required to pay the reasonable value of the use of certain inventive ideas disclosed by an employee to an agent of the corporation in the expectation of payment where an express contract fails for want of proof of the agent's authority. Here the plaintiff, being refused compensation, brought suit upon alleged express contract to pay one-third of the savings realized by the defendants through the use of his devices. During the course of the trial, the aforesaid theory of suit was abandoned and the plaintiff proceeded upon the theory of quantum meruit or unjust enrichment.

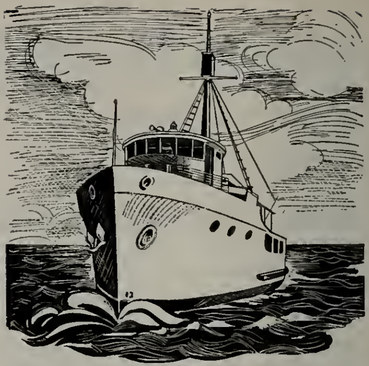
The plaintiff was a man of little education, who emigrating to this country from Italy some 46 years ago, had always worked around the docks and in 1938 was employed as a part-time stevedore on defendant's pier. His case, which the jury quite obviously must have accepted in full, was that in August of that year he informed Furey, defendant's agent in charge of the pier, that he had something which would facilitate cargo loading and unloading, thus saving the defendants much money and preventing the accidents ordinarily occuring at the pier. Mr. Furey visited the plaintiff's home and saw the models and it was claimed by the plaintiff that he promised at that time to give plaintiff one-third of all savings realized by defendants as a result of the use of the device. He permitted the plaintiff to construct the device for defendants on their premises using defendants' materials. Plaintiff proceeded to construct the devices during which time, it might be added, he continued to receive longshoreman's pay. He asked Furey for payment on many occasions in accordance with the alleged agreement. However, he did not receive any payments and subsequently was discharged after which he filed the instant suit. During the period of employment, plaintiff applied for patents for a "Cargo loading and unloading apparatus" consisting of a reversible 5' x 4' wooden pallet and a flexible bridle, a guiding frame, a mesh net, and lifting bars to transport the pallet between ship and pier. The other was for a "Cargo loading and unloading platform," or stationary wooden platform attached to, and extending out from the pier. Over the objections of the defendants, the patents were admitted into evidence and the reviewing court held that they were part of the history of evidence between the parties. The main legal issue on appeal turns, therefore, upon the validity of the claim of unjust enrichment under the circumstances of this case.

The doctrine of unjust enrichment or recovery in quasi-contract does not deal with situations in which the party to be charged had by word or deed legally consented to assume a duty toward the party seeking to charge him. Instead, it applies to situations where as a matter of fact there is no legal contract, but where the person sought to be charged is in possession of money or property which in good conscience and justice he should not retain, but should deliver to another. Where this is true the courts impose a duty to refund the money or the use value of the property to the person to whom in good conscience it ought to belong. The court said that the doctrine is applicable to a situation where, as here, the product of an inventor's brain is knowingly received and used by another to his own great benefit without compensating the inventor. This is recognized in the leading New York case of *Bristol vs. Equitable Life Assur. Soc.,* 132 N. Y. 264, 267. In that case the New York Court of Appeals dismissed a complaint based on the use by defendant of an advertising scheme of which plaintiff had apprised it, because the scheme was not original and because it was not alleged to be marketable. The court, however, was careful to distinguish the situation in which an invention is involved, saying: "In such case (of inventions) there is a production which can, by multiplying copies, be put to marketable use. * * * whoever infringes takes benefits or profits which otherwise would naturally come to the producer."

Courts have justly been assiduous in defeating attempts to delve into the pockets of business firms through spurious claims for compensation for the use of ideas. Thus to be rejected are attempts made by telephoning or

(Please turn to page 130)

Coast COMMERCIAL CRAFT



THE MARY BARBARA

Another Steel Tuna Clipper by National Iron Works

G. J. Bruce Newby, naval architect of Long Beach, designer of the tuna clipper, Mary Barbara.

FOLLOWING ITS FINE "STORM-TESTED" PREDECESSORS into the sea, the sixth steel tuna clipper completed by National Iron Works since the war's end slid down the ways at the company's big shipyard in a colorful launching ceremony March 1. Three more steel vessels—two 106 footers and one 110 footer—are nearing completion.

The 106-foot vessel, christened Mary Barbara, newest in the San Diego tuna fleet, will operate for the sixth and newest of San Diego's busy canneries, People's Fish & Packing Co.

Owners of the $300,000 craft are well-known veterans of the tuna industry, Serefino Parmigiani and J. E. Mellusi, whose wives were matron of honor and sponsor, respectively.

The Mary Barbara is one of a series of steel vessels on which National Iron Works introduced "assembly line" production methods to improve efficiency and speed of production. She is of the raised-deck type, built of electric arc welded steel, with a raked beam and modified tuna vessel stern. The vessel is subdivided with five transverse oil and watertight bulkheads and a transom bulkhead, extending to the main deck to form peak fresh water tanks, a cofferdam for chain stowage, a forward fuel oil deep tank, a machinery space, and eight brine wells arranged in two rows of four each.

Molded beam is 25 feet, molded depth is 12 feet, and molded height to raised deck is 18 feet, 8 inches. Total fish capacity is 160 tons.

With a fuel oil capacity of 32,662 gallons, the Mary Barbara's cruising range is 12,000 miles. Crews' quarters are provided for 14 men.

The galley is served by a model 120 Ingle oil range, manufactured by National Iron Works. The entire refrigeration system was designed and furnished by the Baker Ice Machine Co., Inc., of Los Angeles. Refrigeration compressors are three two-cylinder 20 hp machines, and one two-cylinder, 3 hp machine for galley service.

Main engine is a six-cylinder Atlas Imperial diesel, supercharged to provide 550 bhp. The engine is equipped with a Kingsbury thrust bearing and is freshwater-cooled by means of heat exchangers. Auxiliary generating engines are 220-volt, Atlas six-cylinder Imperial diesels, providing 112 bhp.

Pumps include one ten-inch Campbell Machine Co. vertical bait pump; ten 2½-inch Weinman Brine Circulating Pumps with 2 hp U. S. Motor.

Electric service is a 220-volt, 3-phase, 60-cycle system with ac electric power wherever required, and with 110-

volt single phase, 60-cycle, ac lighting current throughout the ship.

Propeller is by Doran Co., with dimensions 71″ by 60″, and designed especially for the Mary Barbara by William Lambie.

Brief Specifications for Mary Barbara

Length, Over-all	106′
Molded Beam	25′
Molded Depth	12′
Molded Height to Raised Deck	18′8″
Total Fish Capacity	160 tons
Brine Well under Deck	122.8 tons
Brine Well on Deck	27.2 tons
Fuel Oil Capacity, Total	32,662 gallons
Bait tanks and double bottom tanks	21,666 gal.
#1 Brine Wells	10,996 gal.
Cruising Range	Approximately 12,000 miles
Fresh Water Capacity	2,878 gallons
Lubricating Oil Capacity	1,390 gallons

Insulation

5″ of cork in bottoms, sides and on extreme forward and after ends of below-decks brine wells.

4″ of cork in intermediate transverse bulkheads.

4″ of foam glass in shaft alley bulkheads.

5″ of Fiberglas in main deck.

4″ of cork around refrigerated bait box compartments.

4″ to 5″ of foam glass around refrigerated stores compartments.

Crew's Quarters	14 men

1 8-man crew room.
1 2-man crew room.
1 radio room with accommodations for 1 man.
1 Captain's room.
1 Engineer's room with accommodations for 2 men.

Main Engine

Atlas 6-cylinder Imperial diesel, single acting, direct reversible, 4-stroke cycle, 13″ x 16″, 300 rpm, supercharged to provide 550 bhp.

The engine is equipped with a Kingsbury thrust bearing and is freshwater cooled by means of heat exchangers.

Auxiliary Generating Engines

Atlas 6-cylinder Imperial diesels, 92 kva, 220 volt, 3 phase, ac generators direct-connected, 4-stroke cycle, 600 rpm non-reversible, 112 bhp.

Pumps

1 10″ Campbell Machine Company vertical bait pump.

10 2½″ Weinman Brine Circulating Pumps with 2 hp U. S. Motors.

1 2″ Worthington Fire Pump with 5 hp Worthington Motor.

1 3″ Weinman brine transfer pump with 5 hp G.E. Motor.

1 3″ x 2″ Atwell bilge pump with 5 hp U. S. Motor.

Electric Service

220-volt, 3 phase, 60 cycle, ac electric power wherever

Part of the crowd of over 1000 gathered to see the launching of the Mary Barbara, 106-foot welded steel tuna clipper built by National Iron Works for Serefino Parmigiani and J. E. Mellusi.

Master of Ceremonies Art Ponsford introduces Serefino Parmigiani and James E. Mellusi, owners of the Mary Barbara, at the launching of the new 106-foot welded steel tuna clipper.

required, with 110-volt single phase, 60 cycle, ac lighting current throughout the ship.

Hull

The Mary Barbara has a 1½″ x 6″ flat bar keel. Keel plates on each side of the keel bar are ⅜″ steel. Shell plating is 5/16″ steel. Floors are constructed of 5/16″ steel plate in the engine room and wherever floors are oil tight. Other floors are ¼″ plate. A 5/16″ center vertical keel is provided.

A steel box keel is provided under the hull.

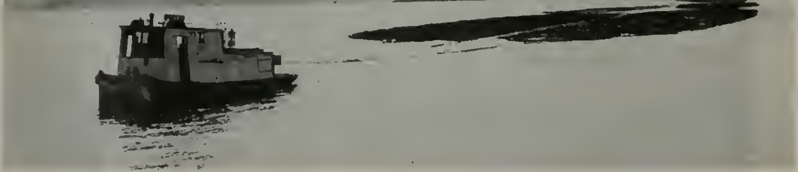
Diesels for Log Rafts on Inland Waters

On Lake Coeur D'Alene, Idaho, in the heart of the nation's northwest timber reserves, two strudy tug boats, the Coeur D'Alene and Pine Cat owned and operated by Lafferty Transportation Company can been seen performing their herculean log hauling tasks. Their tough assignment is to move huge tows of logs, cut from Idaho's abundant timberland, to saw and finishing mills. Here, power and plenty of it is required, for it is not unusual to see either vessel with as much as five million feet of logs in a single tow. Even with the throttles of their powerful diesels wide open, it takes from one to two hours for a boat to start such a tow in motion. Four-inch hawsers, each 100 feet long are used for tow lines. Top speed under full load ranges from 1 to 1½ mph. Each of the tug boats is outfitted with a 130 hp 6 cylinder GM diesel engine operating at 1500 to 1800 rpm. A single screw is driven through a 4 to 1 reduction gear.

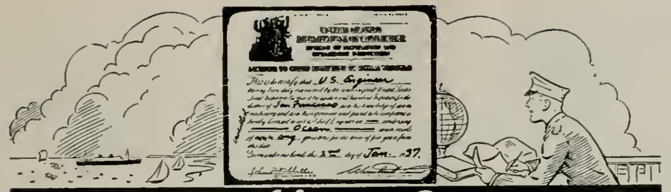
Prior to the installation of GM diesels in 1945, the tugs were powered by wood-burning steam engines. Specially processed composition logs were used in firing the boilers. Not only did this prove to be an expensive kind of fuel, but the boats were too small to carry enough for an entire trip. It was therefore necessary to anchor a raft midway in the lake where boats could stop and refuel. Keeping the barge supplied, as well as the lost time in transit, added considerably to operating costs. With their new diesels, each craft can carry ample fuel for a full trip and, at the same time, save important space for other equipment.

Not the least of the economies realized was in labor. the full time of one man on each boat was devoted to operating the steam plant whereas the diesels require little or no attention. The operator or engineer is now available for other vital duties aboard ship.

A. B. Lafferty, owner of the Lafferty Transportation Company, states that since their installation, the GM diesels have saved his firm over $800.00 a month in operating expenses.



Pine Cat, operated by the Lafferty Transportation Company.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

Combustion in the Modern Marine Boiler

THREE GOOD, SIMPLE AND GENERALLY APPLICABLE RULES for efficient combustion of oil fuel are:

1. It must be introduced into the furnace in a thoroughly atomized state;
2. It must come in contact with the proper amount of air; and
3. There must be sufficient furnace space for combustion to be complete before the hot gasses strike the boiler heating surfaces.

Oil burners is the name generally given to all types of atomizing feeders. These are of two general classes, the steam or air jet atomizing class and the mechanical atomizing class. Practically all modern marine boilers are fitted with mechanical atomizing burners, all of which receive oil under pressure and must be served by a pressure pump. There are various makes and types of pressure pumps for this service all of which claim to be foolproof, but it is the duty of the engineer to maintain these pumps in good order with all joints and glands tight enough to hold the required pressure. Any of the commercial mechanical atomizing burners will produce sufficiently fine atomization for good cumbustion if the others factors are present.

COMBUSTION AIR

Air in the proper amount is one of the big problems in combustion. Satisfactory oil burning efficiency requires approximately 15 pounds of hot dry air to each pound of heavy fuel oil burned. Roughly this means that the pound of oil, one sixtieth of a cubic foot in volume, must in a finely atomized state thoroughly mix with hot dry air having a volume of 300 cubic feet and almost instantly turn into tremendously expanded furnace gases at temperatures approximating 4000° F. abs. Either of the modern water tube boilers installed on a C-3 cargo vessel can when called upon to do so, supply steam for the rated capacity of her turbine 8500 shp. Her plant operates normally at 0.58 pounds of oil per shp hour so that her draft arrangements to the boiler must handle 4930 pounds of hot dry air per hour or 98,600 cubic feet per hour. This figures 2,366,400 cu. ft. per day which is three times the total bale cubic cargo capacity of the

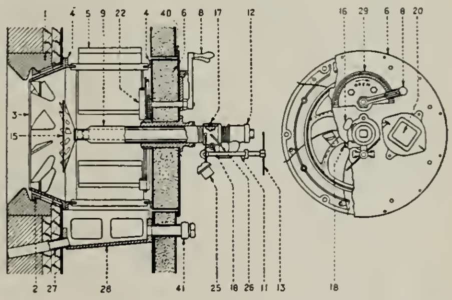


Fig. I. Typical oil burner.

PARTS LIST

1. Firebrick molded tile, 2. Grid for holding tile, 3. Bladed cone, 4. Register, 5. Positive-acting air doors, 6. Insulated cover plate, 8. Handle for operating air doors, 9. Distance piece, 11. Quick-detachable yoke, 12. Mechanical atomizer assembly, 13. Tee handle for setting up atomizer assembly, 15. Impeller plate, 16. Thumb screw, 17. Headless set screw, 18. Seamless-steel oil tube, 20. Peephole door, 22. Spider assembly, 25. Distance piece cover, 26. Distance piece cover spring, 27. Oil drip tube, 28. Oil burner drip pan, 29. Handle quadrant, 40. Gasket, 41. Oil drip cleanout cap.

ship. Figures like this should give every marine operating engineer a healthy respect for that too often neglected boiler auxiliary—the forced draft fan and its motor.

Figure 1 shows a typical marine type oil burner and register. The mixture of oil mist and air must be maintained within reasonable limits at an ideal ratio which changes somewhat with the chemical composition of the oil used. It is controlled by the regulation of the: pressure on the burner; and the air doors on the burner register. In manual adjustment of these factors it was customary to judge combustion by the color of the flame as seen through the peephole, a very unsatisfactory criterion because of the personal factor. The best check is analysis of the flue gases by a continuous CO_2 recorder and by occasional chemical analysis of flue gases in an Orsat or similar apparatus to determine the CO content.

Carbon (C) in Carbon monoxide (CO) is unconsumed carbon and carries with it much of the BTU value of the fuel. When carbon monoxide is formed in combustion one pound of carbon units with $1\frac{1}{3}$ pounds of oxygen forming $2\frac{1}{3}$ pounds of CO and generating a temperature of 2700° F. and 4350 BTU. When CO_2 is formed in combustion, 1 pound of carbon unites with 2-2/3 pounds of CO_2 and generating a temperature of 4980° F. and 14,450 BTU. These figures illustrate the loss due to insufficient air. Excess air has a tendency to absorb heat and cool off the furnace gases.

AUTOMATIC COMBUSTION CONTROL

To maintain proper adjustments for perfect combustion a number of automatic controls of the factors effecting combustion have been designed and used for years in large industrial boiler plants ashore. During recent years many of these controls have been installed on shipboard, particularly on the long time standard types of cargo vessels built by the U. S. Maritime Commission. These controls are designed to regulate the flow of fuel and of air and keep the ideal between them constant while increasing or decreasing both to meet the service demands on the boiler.

Every engineer should become familiar with the theory and functions of these controls. The manufacturers will provide literature to that end. No one should be allowed to tamper with the adjustments on the control board until he knows how the various gadgets function and what they control. In Figs. I and II we illustrate diagrammatically two of the combustion control systems most often used on American marchant ships.

Book Reviews

TANKER MANUAL by John F. Summerill, 150 pages with numerous diagrams and halftone illustrations, bound in red buckram with gold stampings, published by Cornell Maritime Press, New York, price $2.75 net.

The author, a Lt. Commander U.S.N.R., is instructor in the California State Maritime Academy. In this small volume, he presents very simply, a large amount of very pertinent material for the crew of a modern tanker and presents it in a practical and workable form. We would say that each member of a tanker crew should have one of these books.

TANKERMAN'S HANDBOOK by R. G. Wooler, 230 pages with numerous drawings, diagrams and tables, bound in red buckram with gold stampings, published by Edward W. Sweetman, New York 4, N. Y., price $6.50 net.

The author was in tanker engine room operation for 14 years and is founder and president of the American Society of Marine Engineers. The sub-title of his book indicates the contents: A Guide to Loading and Discharging Oil Cargoes. It is a first edition and is unique in its highly specialized field. All essential information relative to handling bulk oil cargo anywhere is here found neatly arranged and adequately indexed. A very useful and very worthwhile compilation of informative data.

Fig. II. Diagrammatic layout of combustion control and superheat control systems for a tanker.

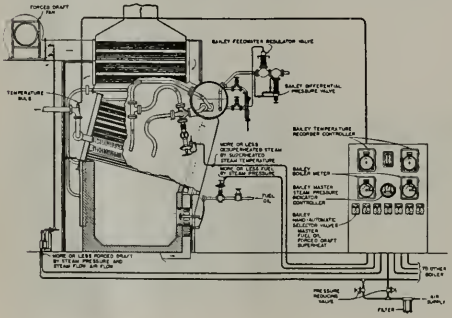
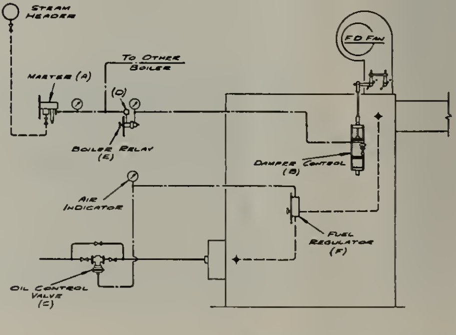
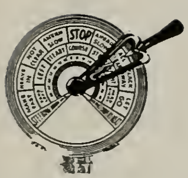


Fig. III. Diagram of typical marine combustion control installation for return flow burners.



Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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A Supercargo's Life A. D. 1556

THIS LETTER OF INSTRUCTIONS TO PURSERS was drafted by English shipowners to govern the conduct of their supercargo on trading voyages between England and North Russia about the middle of the 16th Century, just before the reign of Queen Elizabeth. Remember in reading this letter that the language is 16th Century English, wherein the word "Let" meant to hinder or prevent. It is very evident that the shipowners held these supercargoes responsible for the management of the vessel. The purser also had to be a combination postman, Pinkerton Agent, pastor, piscatorial expert, and good packer. Having proved himself of all these he would probably get a pound sterling a month and eats of a sort if his fishing was good.

We have reproduced this old letter for the benefit of modern deck officers so that they might reflect on the honorable antiquity of their calling and appreciate the advantages of modern comforts at sea.

Mr. Supercargo

1. First, you shall, before the ship doth begin to lade, go aboard, and shall there take and write one inventory by the advice of the master, or of some other principal officer, there aboard, of all the tackle, apparel, cables, anchors, ordnance, chambers, shot, powder, artillery, and of all other necessaries whatsoever doth belong to the said ship; and the same justly taken, you shall write in a book, making the said master or such officer privy of that which you have so written, so that the same may not be denied when they shall call account thereof. That done, you shall write a copy of the same with your own hand, which you shall deliver before the ship shall depart for the voyage to the company's book-keeper, here to be kept to their behalf, to the end that they may be justly answered the same when time shall require; and this order to be seen and kept every voyage orderly by the pursers of the company's own ship in any wise.

2. Also when the ship beginneth to lade you shall be ready aboard with your book to enter such goods as shall be brought aboard to be laden for the company, packed or unpacked, taking the marks and numbers of every pack, bardell, truss or packet coronoya, chest, vat, butt, pipe, puncheon, whole barrel, half barrel, firkin or other cask, mounde, or basket, or any other thing which may or shall be packed by any other manner of way or device. And first, all such packs or trusses, etc, as shall be brought aboard to be laden, and to inquire diligently to know the owners thereof, if you can; and what commodity the same is that so brought aboard to be laden; if you cannot know the owners of such goods learn what you can thereof, as well making a note in your book, as also to send or bring word thereof to the agent, and to some one of the four merchants with him adjoined so speedily as you can, if it be here laden, or to be laden in this river, being not marked with the company's mark, as is aforesaid; and when the said ship hath received in all that the company's agent will have laden, you shall make a just copy of that which is laden, reciting the parcels, the marks and numbers of everything plainly, which you shall likewise deliver to the said book-keeper to the use aforesaid.

3. Also, when the ship is ready to depart, you shall come for your cockets and letters to the agent, and shall show him all such letters as you have received of any

person or persons privately or openly, to be delivered to any person or persons in Russia or elsewhere, and also to declare if you know any other that shall pass in the ship either master or mariner that hath received any letters to be privately delivered to any there, directed from any person or persons other than from the agent here to the agent there, which letters so by you received you shall not carry with you without you be licensed so to do by the agent here, and some of the four merchants as is aforesaid; and such others as do pass, having received any privy letters to be delivered, you shall all that in you lieth let the delivery of them at your arrival in Russia; and also if you have, or do receive, or shall know any other that doth or hath received any goods or ready money to be employed in Russia, or to be delivered there to any person or persons from any person or persons other than such as be the company's goods, and that under their marks you shall, before the ship doth depart, declare the same truly to the said agent and to some of the other merchants, to him adjoined, as it is before declared.

4. Also, when the ship is ready to depart, and hath the master and the whole company aboard, you shall diligently forsee and take heed that there pass not any privy person or persons other than such as be authorized to pass in the said ship without the license and warrant of one of the governors and of the assistants, for the same his passage to be first shown. And if there be any such person or persons that is to pass and will pass without showing the same warrant, you shall let the passage of any such to the uttermost of your power; and for that there may be no such privy person pass under the cloak and colour of some mariner you shall upon the weighing of your ship's anchor call the master and mariners within board by the names and that by your books, to the end that you may see that you have neither more nor less, but just the number for the voyage.

5. Also, if it shall chance the ship be put into any harbour in this coast by contrary winds or otherwise in making the voyage, send word thereof from time to time, as the case shall require by your letters in this manner: "To Master J. B., agent for the Company of the New Trades in S. in London."—If you do hire any to bring your letters, write that which he must have for the postage. And for your better knowledge and learning you shall do very well to keep a daily note of the voyage both outwards and homewards.

6. And principally see that you forget not daily in all the voyage both morning and evening, to call the company within board to prayer, in which doing you shall please God, and the voyage will have the better success thereby and the company prosper the better.

7. Also in calm weather and at other times when you shall fortune to come to anchor in the seas during the voyage, you shall for the company's profit and for good husbanding of the victuals aboard, call upon the boatswain and other of the company to use such hooks, and other engines they have aboard to take fish with, that such fish so taken may be eaten for the cause aforesaid; and if there be no such engines aboard, then to provide some before you go from hence.

8. And when God shall send you in safety into the Bay of St. Nicholas at anchor you shall go ashore with the first boat that shall depart from the ship taking with you such letters as you have to deliver to the agent there, and if he be not there at your coming ashore, then send the company's letters to Colmogro to him by some sure mariner or otherwise, as the master and you shall think best; but go not yourself at any hand, nor yet from aboard the ship unless it be ashore to treat with the agent for the lading of the ship that you be appointed in, which you shall apply diligently to have done so speedily as may be. And for the discharging of the goods therein in the bay, to be carried from thence, see that you do look well to the unlading thereof, that there be none other goods sent ashore than the company's and according to the notes entered in your book as aforesaid; if there be inquire diligently for whom they be and what goods they be, noting who is the receiver of the said goods, in such sort that the company may have the true knowledge thereof at your coming home.

9. Also, there ashore, and likewise aboard, you shall spy and search as secretly as you may, to learn and know what bargaining, buying, and selling there is with the master and marines of the ship and the Russians, or with the company's servants there; and that which you shall perceive and learn you shall keep a note rhereof in your book, secretly to yourself, which you shall open and disclose at your coming home to the governors and the assistants in such sort as the truth of their secret trades and occupyings may be revealed and known. You shall need always to have Argus' eyes, to spy their secret packing and conveyance, as well on land as aboard the ship, of and for such furs and other commodities as yearly they do use to buy, pack and convey hither. If you will be vigilent and secret in this article you cannot miss to spy their privy packing one with another, either on shore or aboard the ship; work herein wisely, and you shall deserve great thanks of the whole country.

10. Also at the lading again of the ship you shall continue and abide aboard to the end that you may note and write in your book all such goods and merchandise as shall be brought and laden, which you shall orderly note in all sorts as heretofore, as in the second article partly it is touched; and in any wise put the master and the company in remembrance to look and forsee substantially to the roomaging of the ship, by fair means or threats, as you shall see and think will serve for the best.

11. Thus, when the ship is fully laden again and all things aboard in good order and that you do fortune to go ashore to the agent for your letters and despatch away, you shall demand whether all the goods be laden that were brought thither, and to know rhe truth thereof you shall repair to the company's storehouse there at St.

(Please turn to page 128)

San Francisco Bay Shipyards

For some time past we have been hearing on all sides that Pacific Coast Shipbuilding is dead, that all the reconversion and repair work is going to Atlantic Coast yards and there is little hope for the future of the shipbuilding industry here. Getting a little fed up on this talk, we made a cursory survey of the larger shipyards in San Francisco Bay area and found some figures that astonished us.

In the first place, as described in the lead article of this issue the United Engineering Company is engaged in the largest reconversion job in the country, the three Matson liners, and are currently employing approximately 4000 men.

Bethlehem-Alameda is finishing the two largest passenger vessels building in America and is employing 3300 men, with much of the work subcontracted to companies employing hundreds more.

Bethlehem San Francisco is repairing or reconverting many ships with an employment of 3200 men.

General Engineering & Dry Dock Co. has considerable work and employes 1000 men, their lowest mark in many years.

Moore Dry Dock has 1500 men working.

The San Francisco Naval Base has much work ahead

An aerial view of Bethlehem's San Francisco yard, showing an Army transport, SS General W. M. Weigel, a sister vessel, passenger liner General M. C. Meigs, both up on floating docks and seven other seagoing vessels undergoing repairs or reconversion.

and on hand and presently employs 7500 persons at Hunters Point and 10,500 at Mare Island.

The many other repair yards and boat yards lumped together, are responsible for at least 3000 men, making a grand total of 34,000 men working at the shipyard business on San Francisco Bay, which is equivalent to approximately $9,000,000 a month.

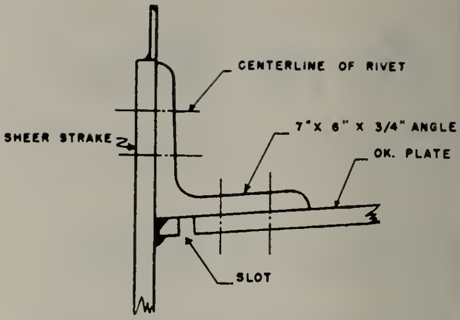
Two other interesting items we have noted in the news on Pacific Coast shipbuilding. First there are only seven seagoing passenger vessels building in American yards and five of these are in Pacific Coast yards— 3 for Alcoa at Oregon Shipbuilding Corp. and 2 for American President Lines at Bethlehem Alameda. Second, the total orders for new construction issued to American yards in February 1947 were for 18 barges and one seagoing tug. The only powered vessel—the tug—went to a Pacific Coast yard, Gunderson Bros. Engineering Corporation of Portland, Oregon.

We submit there is still a very healthy and energetic life in Pacific Coast shipbuilding.

Cracks Stopped — Draft Increased — Bottoms Repaired

THE SAN FRANCISCO YARD of the shipbuilding Division, Bethlehem Steel Company is very busy on a large variety of repair, re conditioning and correction work. Three interesting jobs are illustrated herewith.

First a crack-stopping operation on the Liberty type steamer, Abigail Adams. A cut was burned in the deck (see diagram) about one inch from the shell for a distance slightly over the midship half-length of the ship and a 7″x6″x¾″ angle double riveted in place with ⅞″ diameter rivets. The weight added to the ship is slightly over six and one half tons. This is the approved A.B.S. method of crack stopping for completely welded hulls.



Gunwale Arrestor

Closeup view of riveted gunwale angle installation on SS Abigail Adams.

The second unusual operation, said to be the first of its kind ever completed in a Pacific Coast shipyard, was performed on a Grace Line C-2 shelter deck vessel, SS Santa Juana. As originally designed her maximum allowable draft for one compartment subdivision was 25′ 9¾″. The operation consisted of increasing longitudinal strength by riveting ⅝″ thick by 48″ wide doubler plates to her shelter deck sheer strake port and starboard for 120′ forward and 70′ aft of the bridge; and riveting doubler plates ½″ thick and 61¼″ wide along the full length of the bridge deck sheer strake. All of these sheer strake doublings were welded together at the butts. To compensate for cargo side ports between the shelter deck and the second deck doubling plates 48″ wide by ⅝″ thick were welded by plug and edge weld-

Sheerstrake doubling plates being butt welded.

ing to the shelter deck stringer plate from the bridge front bulkhead for 19 feet aft. The net result of all of this strengthening was to give this ship 27 feet, 7¼ inches allowable draft and so increase her deadweight carrying capacity by approximately 1070 tons.

One of the largest repair jobs was the renewing of the bottom of the APL C-3 cargo liner, President Taft. This vessel ran on a sand spit late last summer and suffered bottom damage. She went on dry dock in the San Francisco yard January 6th, and it was found necessary to renew every flat plate for 65 per cent of the area of the bottom and a number of shell plates, as well as to fair numerous other plates. Over 170 tons of new steel plate went into this job. The vertical keel had to be cropped and faired in place for the full length of the renewed bottom. At the conclusion of this work all of the double bottom tanks were given a hydrostatic test and proved tight to the satisfaction of the owners and classification society requirements.

David C. Buchan, boss shipwright, checking to see that there are sufficient shores under the President Taft while damaged sections of shell plates and floors are being removed.

First United Fruit Ship Delivered

Delivery was made March 6th by the Bethlehem-Sparrows Point Shipyard, Inc., of the SS Yaque, first of the new fleet of nine refrigerated cargo ships building for the United Fruit Company. The second delivery is scheduled for this month and others at the rate of about one a month. These vessels will partially replace the 21 United Fruit Line ships lost by enemy action during the war.

Officials of the United Fruit Company, Bethlehem's Shipbuilding Division, The American Bureau of Shipping, the U. S. Maritime Commission, and U. S. Coast Guard witnessed the official trial on March 4 and spoke enthusiastically of the vessel. Among them were H. Harris Robson, vice president, and J. V. O'Sullivan, superintendent of New Construction, United Fruit Company; W. H. Collins, vice president, Bethlehem Steel Company, Shipbuilding Division; J. M. Willis, general manager, Baltimore District, and F. A. Hodge, manager of the Bethlehem-Sparrows Point Shipyard.

Of screw type, completely refrigerated with a cargo capacity of 195,000 cubic feet these ships have an overall length of 385 feet 11½ inches, with a beam of 56 feet and depth of 35 feet. They will operate fully loaded with a 26 foot draft. A normal 5500 shaft horsepower propels the ship, generated from a steam turbine reduction gear drive, which produces a cruising speed of 16 knots. Excellent accommodation is provided for 12 passengers.

SS Yaque, first of new fleet of nine refrigerated cargo-passenger ships, building in Bethlehem's Sparrows Point Shipyard for United Fruit Company.

TWO GREAT APPOINTMENTS

James B. Black

James B. Black to the Advisory Committee on the Merchant Marine

ON MARCH 11, President Truman wrote to five outstanding citizens that he was establishing an advisory committee on the Merchant Marine, and his letter so adequately set forth his purpose that we quote it in full. That he chose the personnel of the committee wisely will be apparent from a reading of the list:

K. T. Keller, president, Chrysler Corporation, Detroit, Mich.

Marion B. Folsom, vice chairman, Business Advisory Council for the Department of Commerce, Treasurer, Eastman Kodak Company, Rochester, N. Y.

Andrew W. Robertson, chairman of the Board, Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa.

James B. Black, president, Pacific Gas and Electric Company, San Francisco, California.

Vice Admiral Edward L. Cochrane, USN, formerly Chief, Bureau of Ships, U. S. Navy, president, the Society of Naval Architects and Marine Engineers.

Mr. Keller was appointed chairman and Mr. Folsom vice chairman.

The Maritime industry is well pleased with the president's action and the Pacific Coast is happy over the appointment of Mr. Black. The President's letter follows:

"Dear Mr. Black:

"As an aftermath of the war, the United States faces critical problems in connection with the construction, modernization and maintenance of an adequate fleet of passenger and freight vessels. With no new passenger liners and few cargo vessels scheduled to be built in the immediate future, the Nation is not assured of the existence of a balanced and modern merchant fleet. This is a matter that concerns not only our commerce and trade, but our national security as well.

"Even before the war we had few passenger vessels. When we entered the war, we shifted to the construction of mass-produced cargo ships, in order to carry America's great production of war materials overseas. We used all our prewar passenger vessels, one-third of which were more than 20 years old, as transports or fleet auxiliaries. Some of these were sunk or badly damaged, and many others were so drastically altered for war use that their complete reconversion to peacetime needs is not economically justified.

"Although our present need is primarily for passenger ships, our ship construction program as a whole merits careful consideration. As an important element of national security in connection with preparation for expansion in case of emergency, it is essential that shipbuilding skills be maintained by shipbuilders through an orderly replacement program of all types of vessels. Latest technological developments must be incorporated into our future cargo and combination cargo-and-passenger vessels, as well as into passenger liners, if the United States is to maintain a well-balanced modern merchant fleet to meet trade as well as security requirements.

"I feel that the whole problem should be carefully studied in all its phases by a group of citizens equipped by background and training to counsel the government and assist it in formulating a program to strengthen our merchant marine. Accordingly, I have established an Advisory Committee on the Merchant Marine, and ask you to serve upon it. The Committee should meet with representatives of the Navy Department, the United States Maritime Commission, and the leading authorities in the ship operation and shipbuilding industries. After studying the problem, the Committee should present for my consideration its recommendations as to the number and types of merchant vessels to be constructed annually under a stable, long-range program, as well as any other recommendations that the Committee feels will prove helpful. Its findings will assist me in developing a sound Merchant Marine policy and in formulating proposals to the Congress for any necessary legislation. The heads of the Executive Department and agencies concerned stand ready to give you all possible aid.

"Sincerely yours,

/s HARRY S. TRUMAN."

That James B. Black has the confidence of industry in general is apparent from the great trust that has been

FROM THE WEST!

placed in him as evidenced in the following brief biographical sketch:

Born: Sycamore, Illinois, May 6, 1890.

Education: California School of Mechanical Arts (Lick School), San Francisco, graduated 1908. University of California, Berkeley, 1912 (B. S. of Mechanical Engineering).

Business Career: Service Inspector, Great Western Power Company, 1912; General Sales Manager, 1918; General Manager, 1922; Vice President and General Manager, 1923.
Vice President, Western Power Corp. (of which Great Western Power Co. was a subsidiary) in 1926.
Vice President, The North American Company, New York, 1927.
President, Pacific Gas and Electric Company, San Francisco, November 20, 1935.

Principal Corporation Directorships: Pacific Gas and Electric Company, Director and Member of Executive Committee.
Southern Pacific Company, Director and Member of Executive Committee.
United States Steel Corporation.
Equitable Life Assurance Society of the United States.
Fireman's Fund Insurance Company.
Fireman's Fund Indemnity Company.
Del Monte Properties Company.
California Pacific Title Insurance Company.

Other Affiliations: Edison Electric Institute (Member, Advisory Committee).
California Palace of the Legion of Honor (Trustee).
Business Advisory Council, U. S. Dept. of Commerce (Member).
Musical Association of San Francisco (Member, Board of Governors).
St. Luke's Hospital (Director).
Advisory Council, School of Business Administration, University of California (Member).
Graduate School of Business, Stanford University, Consulting Professor of Public Utility Management.

Clubs: Chi Phi, Golden Bear, Skull and Keys, Tau Beta Pi (U. of Calif.), Big "C" Society.
The Links, New York; Pacific-Union, Bohemian, the Family, San Francisco Golf Club, San Francisco; Cypress Point Club, Pebble Beach, California.


Joseph K. Carson, Jr.

Joseph K. Carson, Jr., to the Maritime Commission

Attorney Joseph K. Carson, Jr., of Portland, Oregon. of which city he is former mayor, has been appointed by President Truman to be a member of the Maritime Commission and the appointment is highly pleasing to those who are anxious about the future welfare of the American Merchant Marine. Immediately after his confirmation by the Senate, Mr. Carson made a hurried visit to the major port cities of the Pacific Coast and brought himself in contact with maritime commission activities as well as with industrial leaders and the press. It was with great relief that the shipping industry learned of the appointment of this outstanding Pacific Coast representative to a commission whose work will so vitally affect the future of Pacific shipping.

In a letter to the Pacific Marine Review prior to his confirmation by the Senate, Mr. Carson indicated a deep interest in his expected duties and a full appreciation of their vital importance to the industrial West.

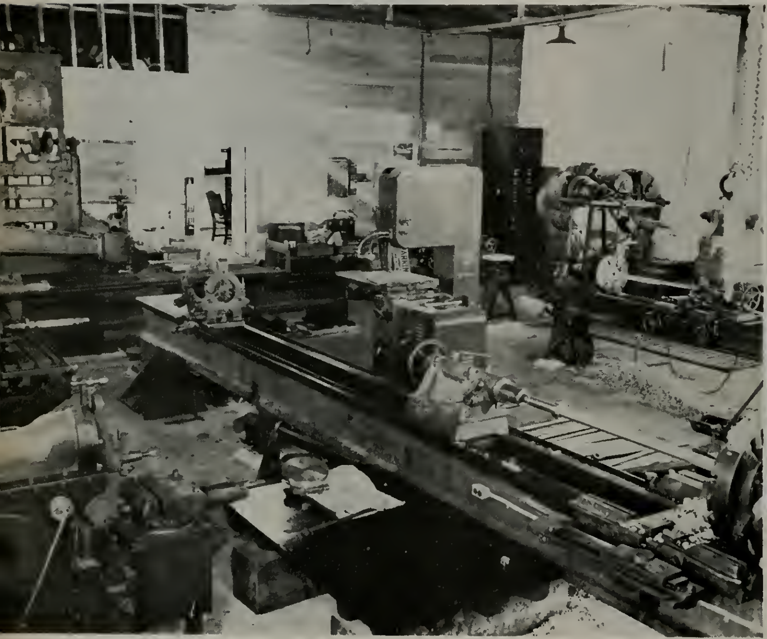
Turnbull Succeeds Alvord at G. E.

Ray W. Turnbull, president of Hotpoint Company since 1941, has been named to succeed Raymond Alvord as Commercial vice president of General Electric Co. Pacific District, with headquarters at San Francisco. The announcement comes from Charles E. Wilson, president of G. E. Pacific District includes California, Arizona, Utah, Nevada, Hawaii and parts of Idaho and Wyoming.

The change is effective September 1 and Alvord will retire on September 30, after 43 years of service with the company.

Running Lights

Edited by B. H. BOYNTON



◄ Cavanaugh Machine Shop in action.

▲ Frank Cavanaugh, founder of Ship repair and engineering firm bearing his name.

Cavanaugh Machine Works

Frank Cavanaugh has formed a ship repair and engineering company under name of Cavanaugh Machine Works, located at 220 East B street, Wilmington, California. The new organization will specialize on voyage repairs to vessels docking at Los Angeles Harbor.

Cavanaugh Machine Works has a well equipped machine shop specially tooled for marine work. Cavanaugh formerly operated the West Coast Shipbuilding and Dry Dock Company at San Pedro. For twelve years he was with the Los Angeles Shipbuilding and Drydock Company.

One of the firm's current jobs is converting LCI's to 400-ton freighters for the Francis Shipping Company of Los Angeles; with a similar job under way for the Aurora Shipping Co., Inc. This work includes rearrangement of cargo hatches, installing king posts and winches, and engine overhaul. Refrigeration spaces and equipment are being rearranged, also the quarters aboard each vessel. These vessels are equipped with 1500 horsepower General Motors diesels.

Cavanaugh Machine Works, in addition to the machine shop, has portable compressor machines and welding equipment for hull repairs at any berth in Los Angeles Harbor area. Among the shop tools are a 72″ lathe, 36″ lathe with 30 foot bed; openside planer, 36″ x 36″ x 12′ bed; 24″ shaper; No. 3 milling machine, horizontal grinder, one 12″ lathe and one 20″ lathe; new Do-All machine, vertical drill with 6′ arm which permits work in 12′ radius.

Southern California Propellers Hold Joint Luncheon With Bilge Club

On February 26 the two Southern California Maritime Clubs held a combined luncheon at the Palos Verdes Country Club to hear a talk by Lieutenant J. Vaughn, USMS.

L. to R.—T. C. (Tom) Cook, Richfield Oil; Kenneth T. Connell, Shell Oil; Harold S. Bowen, Llewellyn Supply; Howard A. Foster, USN Shipyard, Terminal Island; B. W. Simmons; Comdr. H. B. Roberts, USCG; S. A. Hodges, Mackay Radio & Telegraph Co.

Top, L. to R.—Howard Woodruff, Marine Exchange; Lieut. Jim Vaughn, USMS; Commodore L. L. Bennett, USCG, Commandant 11th CG District; E. A. MacMahon, Pres., Propeller Club; Al Boro, Pres., Bilge Club, J. M. Costello Supply Co.

Bottom, L. to R.—E. Kilbourne U. S. Maritime Commission; Robert Furness, U. S. Maritime Commission; Capt. T. C. Linthicum, Long Beach Terminals Co.; Capt. Ray Johnson, Crescent Wharf & Whse. Co.

Top, L. to R.—J. M. Costello, J. M. Costello Co.; F. A. Hooper, American-Hawaiian Steamship Co.; L. C. Munson, Distr. Mgr., Williams Dimond Co.; T. W. Buchholz, Metropolitan Stevedoring Co.

Bottom, L. to R.—E. A. MacMahon, Pres., Propeller Club; Al Boro, Pres. Bilge Club, J. M. Costello Supply Co.; Capt. F. F. Ellis, Technical Director, motion picture studios; Rear Admiral Albert Ware Marshall, USN (Ret.).

BILGE CLUB
NINETEENTH ANNUAL BANQUET
BILTMORE HOTEL LOS ANGELES FEBRUARY 22, 1947

Left to right: Art Strum, Coastwise, Pacific Far East Lines; George Downey, Coastwise, Pacific Far East Lines, and Pat Osborn, United States Lines.

L. to R.: Bob Snodgrass, Secretary of Bilge Club; Winn Rash, California Bank; Howard S. Bowen, Llewellyn Supply Co., and Walter Richards, Wilmington Iron Works.

BILGE CLUB ANNUAL BANQUET

On these two pages are scenes of the 19th Annual Bilge Club Banquet held February 22 at the Biltmore Hotel, Los Angeles.

R. R. Fenton, Union Oil; Joe Barry, Tubbs Cordage Co.; Jim Buntin, Harbor Boat Bldg.; R. L. Moser.

Ernie A. MacMahon; Rolf Monson, Todd Ship; Floyd Nelson, Texas Oil Co.

L. to R.—F. H. Ryan, Cliff Dykes, Lloyd G. Emerson, Ed Whittemore, Clarence Winnaman, Bill Sampson, Knox Price. All members of Atlas Paint Company organization.

L. to R.—Louis Towne Rolling Hills; Walter Brown, Brown Bros.; Henry Epstein, L. A. Examiner; Leon Brown, Brown Bros.; Dr. O. Jacobs, San Pedro; Walter Johnson, American President Lines.

◀ George B. Plant heads up Sopac Ship Maintenance firm.

SOPAC Ship Maintenance Staff

The Sopac Ship Maintenance Company, 1168 Battery Street, San Francisco, was established in March 1945 by George B. Plant on his release from the U. S. Army Previous to his Army service, Plant was in the truck transportation business and, at present owns and operates The International Freightways.

Bill Harris, sales manager of Sopac was formerly manager of the Coastwise Marine Service Company, and for eight years has occupied various positions in the production phases of ship construction.

Roy A. Lazzari, manager of operations, was formerly with United Engineering Company and other ship repair concerns in the San Francisco Bay Area.

Shoreside Personalities

Hugh Gallagher, Matson Navigation Co., San Francisco has been made a member of the 12 man Committee appointed by the National Federation of American Shipping, Inc. to determine an industry-wide policy on radar.

▲ Roy A. Lazzari and Bill Harris of Sopac Ship Maintenance Co.

Terco Equipment in Larger Quarters

T. E. Rackerley of Terco Equipment Company announces the removal of the company to new and more commodious quarters at 939 Howard Street, San Francisco.

The Company has been appointed distributors in the Bay Area in the marine and industrial field for Walworth Company products, and the Gotham Company thermometers.

New G. E. Apparatus Manager At Los Angeles

On March 1, G. F. Maughmer succeeds S. E. (Sam) Gates as manager of the General Electric Co.'s Los Angeles Office, Apparatus Department. Mr. Maughmer has been assistant manager under Mr. Gates since April, 1945.

Newly-appointed manager, Mr. Maughmer, came to Los Angeles as assistant manager in 1945 from San Francisco where he had served for two years as assistant to R. M. Alvord, commercial vice president and then manager of G. E.'s Apparatus Department, Pacific District. He is a former chairman of the Arizona section of the American Institute of Electrical Engineers, a member of Tau Beta Pi, honorary engineering society, Delta Sigma Rho and Phi Kappa Phi, honorary scholastic society. He also served as vice president of the Phoenix Rotary Club.

Tang Heads Chinese Department Pacific Far East Lines

T. Y. Tang, former general manager of the Chinese Chamber of Commerce at San Francisco, is named head of the Chinese department of Pacific Far East Line, Inc., of San Francisco. Mr. Tang is well known in foreign trade circles on this Coast and in the Orient.

Fairbanks, Morse's New Los Angeles Branch Manager

R. H. Morse, Jr., vice president and general sales manager of Fairbanks, Morse & Co., Chicago, recently announced the appointment of John A. Cuneo as manager of the company's Los Angeles Branch, succeeding Harry W. Brown who has retired.

J. A. Cuneo, manager Los Angeles Branch of Fairbanks, Morse & Co.

Karl French, naval architect and marine engineer.

Karl French Enlarges San Pedro Offices

Karl French, well-known naval architect and marine engineer, is now located in expanded quarters at 112 W. 7th street, San Pedro. The firm is engaged in naval architecture, marine engineering, design, supervision, surveys and reports.

Mr. French has been in California engaged in shipbuilding and design since 1940. As far back as 1922 he gained early experience in the Bethlehem Quincy yard. Upon completing his M. I. T. course Mr. French went with Federal Shipbuilding at Kearny, New Jersey, where he worked directly under W. W. Smith, chief engineer, on Thermodynamics in connection with the Morgan Line's steamship Dixie, first high pressure steamship in the United States.

During the next few years Mr. French saw service with United Drydocks, Bethlehem yards and in the Bureau of Construction and Repair of the Navy at Washington, D.C. He had seven years on damage control for the Navy,—this period marked the initial development of this phase of naval activity, which did much toward our naval victory in World War II. He came to the West Coast in 1940, and since arrival in Los Angeles Harbor area was naval architect and chief engineer at Los Angeles Shipbuilding and Dry Dock Company; later served as naval architect at Western Pipe's San Pedro shipbuilding division, leaving that firm last year to open his own offices.

Cortright General Sales Manager for Clayton Mfg. Co.

The Clayton Manufacturing Company, El Monte, California, announces the appointment of J. A. Cortright as general sales manager, succeeding L. F. Working, retired.

Cortright, who joined the company in 1935 as field representative, has been sales manager of the Kerrick Kleaner division since 1941. His promotion places him in charge of sales, advertising and field service for the complete Clayton line, including Kerrick Kleaners and cleaning compounds, Kerrick Hydro-Steam Kleaner, Clayton engine and chassis dynamometers, Clayton Steam Generators and other allied equipment and products.

Coincident with the announcement of Cortright's appointment as head of sales and advertising comes word that the Clayton Manufacturing Company has marked the transition by moving into a new and modern twenty-acre plant in El Monte.

J. A. Cortright

W. V. Harloe

United Fruit Traffic Post To Harloe

W. V. Harloe assumed the post of general manager, Freight and Passenger Departments of the United Fruit Company on March 1, with headquarters at Pier 3, North River, New York, according to announcement issued from General Office, Boston, by A. A. Pollan, executive vice president. This assignment places Mr. Harloe in full charge of all the company's traffic matters, both freight and passenger.

In keeping with company policy, this is a career appointment. Mr. Harloe has devoted many years of service to traffic problems of the United Fruit Company in capacities of ever-increasing managerial responsibility. He has had long and intimate association with many phases of traffic operation and comes to his new assignment with a broad background not only of domestic traffic affairs but also with shippers and shipping problems in Latin America and abroad.

Paul Joslyn Opens Own Office

Paul L. Joslyn announces the dissolution of the partnership of P. L. Joslyn and M. J. Ryan, formerly at 144 New Montgomery Street, San Francisco. Mr. Joslyn has now opened his offices as Consulting Engineer in the marine and industrial field at 444 Market Street, San Francisco.

THE WOMEN HEAR ABOUT SHIP REPAIR FROM A MANAGER OF A SEAGOING GARAGE

Women's Organization for the American Merchant Marine, Port of San Francisco, had as guest speaker W. Miller Laughton, district manager of Bethlehem's West Coast Yards, the new president of the San Francisco Propeller Club of the United States. Seated at the luncheon held at the Army-Navy Club, prior to the March meeting are: Mrs. Henry F. Grady, program chairman of the Women's Organization; Mrs. Frazer A. Bailey vice president; Mr. Laughton and Mrs. Harry W. Parsons, president of the Women's Organization.

George Swett Adds Purekold To His Line of Products

George E. Swett & Co., engineers, San Francisco, announce the addition of Purekold refrigeration deodorizer and moisture balancer to the famous products they handle.

According to George Swett, Pure-Kold prevents the intermingling of strong flavors within refrigerators and thereby preserves the natural flavor of each food. It also reduces the dehydration of foods. It is a permanent activated combination of 21 oxides and is revitalized by simply placing the unit outside of the refrigerator in fresh dry air once a month or when defrosting.

Long Beach Jr. Chamber Plans a Show

Many western industries will be represented in the Port-O-Trade Exposition, slated to be held June 13-22, in the Port of Long Beach. Sponsored by the Junior Chamber of Commerce and backed by the Harbor Commission of Long Beach, the manufacturers' show is being held as a dedication to the new transit shed now being completed for the Calmar Lines.

For the show, the 600-foot long shed, most modern of its kind in the world, will house exhibits by firms active in manufacturing or distributing, with particular emphasis placed on those whose goods are handled through foreign trade. At the close of the exposition the shed will be utilized by Calmar as their southern California terminal.

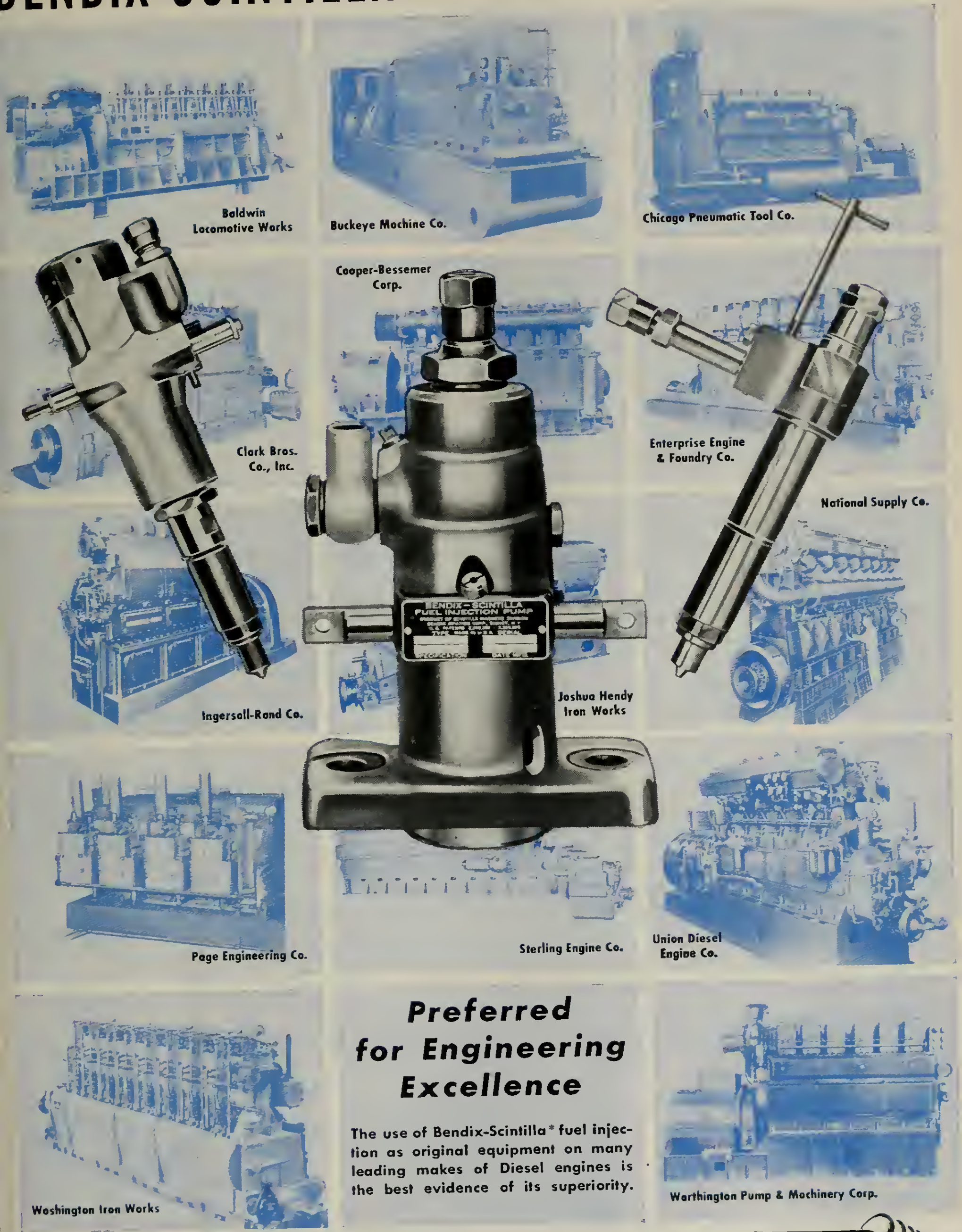
As part of the opening day ceremonies, 3500 delegates to the National Junior Chamber of Commerce Convention will be honored guests. These key representatives of some one thousand U. S. communities will be shown through the exposition and taken on a trip through the harbor, so they may take with them the story of the Port of Long Beach, the value of foreign trade, and the part contributing industries have in it.

Hagan Corp. Purchases Ring-Balance Instrument

The Hagan Corporation, combustion and chemical engineering firm, has purchased the Ring-Balance Instrument Company of Chicago, thus rounding out its present combustion and process control business with a line of industrial meters, J. M. Hopwood, Hagan president announced. The transfer of control took effect March 3, and all management and other personnel were retained and operation of the Chicago plant continued.

Hagan Corporation is parent organization to three others: Hall Laboratories and the Buromin Company, consulting firms in boiler water conditioning for land and marine service; and Calgon, Inc., producers and marketers of sodium phosphate in specialized forms for treatment of textiles, leather, foodstuffs and other industrial and commercial products.

BENDIX-SCINTILLA *FUEL INJECTION EQUIPMENT*



Preferred for Engineering Excellence

The use of Bendix-Scintilla* fuel injection as original equipment on many leading makes of Diesel engines is the best evidence of its superiority.

BENDIX SCINTILLA

SCINTILLA MAGNETO DIVISION *of*
SIDNEY, N. Y.

*TRADEMARK

Bendix
AVIATION CORPORATION

Pacific Marine Review

NEWS FLASHES

BIG P-2 CONVERSION JOBS SCHEDULED FOR CALIFORNIA YARDS

Three big Army transports, the Admiral C. F. Hughes, Admiral E. W. Eberle and Admiral W. S. Sims, are to undergo reconversion for permanent peacetime transport service in California yards at an estimated cost of $3,000,000 each. A fourth ship may be added to the group on the Pacific Coast and two more on the East Coast. Possible bidders are Bethlehem (San Francisco and San Pedro); Todd, San Pedro; Moore, Oakland; General Engineering, San Francisco. Bid opening date is April 18.

MC EXPERTS DRAFT PLANS FOR 116 SHIPS

A long-range merchant shipbuilding program calling for the construction of 116 new vessels is now undergoing study by the Maritime Commission. Prepared under the direction of Hugh D. Butler of the commission's division of economics and statistics, this tentative program calls for the construction of 31 combination passenger-freight liners and 85 special types of freighters aggregating 900,000 dwt tons. The program has been proposed to supply the U.S. with a "balanced" merchant marine of 1,044 ships and 11,400,000 dwt tons in 1950 or thereabouts. A breakdown of these figures puts foreign trade needs at 13 combination passenger-cargo ships and 18 cargo-refrigerated vessels. Domestic needs are estimated at 18 combination passenger-cargo and 67 freight liners. Shipping circles believe this tentative plan will be made available to the new shipping advisory committee appointed by President Truman to study this subject.

* * * * *

MATSON ANNOUNCES CONVERSION OF TWO C-3s

The Matson Navigation Co. announces conversion of the C-3 vessels Sea Skimmer and Sea Blenny. The Sea Skimmer will take 100 days from April 21 and cost $519,470 and the Sea Blenny will take 100 days from May 7 and will cost $515,970.

* * * * *

DRAVO GETS BARGE ORDERS

Dravo Corporation, Pittsburgh, has been awarded a contract to build two 2000-hp, twin screw, diesel-propelled towboats for the Standard Oil Company of New Jersey. The new boats, each 166' x 36' x 10'6" in size, will be used by Standard in the lower Mississippi River trade. Also, the Standard Oil Company of New Jersey has awarded the Engineering Works Division a contract (W-1694) covering the construction of six barges. The welded steel tank barges will be 195' x 35' x 9'9" and the first is scheduled to be delivered afloat at Neville Island in September.

Dravo has also received a contract covering the construction of two 135' x 27' x 7'6" all welded steel barges for J. K. Davison & Bro. Co., of Pittsburgh. The barges (W-1692) will be of the raised deck type used for transporting sand and gravel.

* * * * *

SHELL NEGOTIATING FOR U.S. TANKERS

The British Shell petroleum interests are planning to acquire a number of

T-2 type tankers from the Maritime Commission, according to reports received here recently from Britain. George Leigh-Jones, managing director of the Anglo-Saxon Petroleum Co., Ltd., is reported to have confirmed reports of Shell's plans and to have said that the number of tankers being sought would "run into double figures."

* * * * *

MATSON APPLIES FOR TANKERS

The Matson Navigation Co. has applied to the Maritime Commission for three T-2 tankers and intends to use them in charter service on the Pacific Coast, reportedly carrying petroleum coastwise for Shell Oil Co., with an occasional run to Hawaii.

* * * * *

ICC HEARING SCHEDULED

The anxiously awaited hearing by the Interstate Commerce Commission on intercoastal freight rates has been set for June 22. Coastwise negotiations between steamship and railroad companies will start immediately.

* * * * *

KAISER BID FOR YARD NO. 3 REJECTED

The office of Henry J. Kaiser announced that the U.S. Maritime Commission has rejected his offer to lease Richmond, Cal., Shipyard No. 3, but said the commission was willing to negotiate further. Kaiser was the only bidder for the yard.

It was understood that the commission's main objection to the Kaiser offer was that it provided for use of the yard for the first year without rental. Another point of objection was that the West Coast industrialist wanted to use the property for other enterprises in addition to shipbuilding and repair.

Further negotiations on the contract will start soon, Kaiser spokesmen said.

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INCREASE IN MINES LOOSE FORESEEN

The Navy warns that the number of mines drifting at sea is expected to increase as time and weather break the mooring cables of the thousands laid during the war.

* * * * *

GIANT GENERAL PETROLEUM BUILDING

The new multi-million dollar General Petroleum building, to be erected on Flower Street, from Sixth Street to Wilshire Blvd., will be Los Angeles' largest office structure. The building will have 504,452 gross feet of floor space, with a net floor space of 343,732 square feet. All but three and one-half floors of the height limit building will be occupied by General Petroleum executives, officials and employees. Wurdeman and Beckett are the architects and the P. J. Walker Company will be the contractors. Construction will start this summer.

* * * * *

MARINE SURPLUS WILL GO TO WAA

Activities of the Maritime Commission in the disposal of surplus property, except for ships and small vessels, will be transferred to the War Assets Administration by April 5.

* * * * *

PRIVATE FIRMS TO TAKE OVER SHIPPING OF NAVY FUEL

The Navy is getting out of the petroleum business at some Pacific bases, and turning the reins over to private companies, Washington advices say.

Aviation gasoline and other petroleum products will soon be supplied by private oil concerns on Wake, Midway, Canton, Guam and Palmyra.

Tentative plans worked out call for the Navy to turn over all necessary facilities to the CAA which would lease them to Standard of California, Standard-Vacuum, Union Oil Co. of California and Shell Asiatic. Companies would operate facilities jointly but each will do its own marketing.

* * * * *

LARGEST LIQUID CARGO BARGE TO BE BUILT BY BETHLEHEM

Bethlehem Steel Company's Staten Island Yard has been awarded a contract for construction of one of the largest non-propelled liquid-cargo barges ever built.

To be constructed for the National Lead Company, the barge will be an all-welded steel craft 246 feet long, with a beam of 43 feet and depth of 20 feet 9 inches. Of 3,925 tons displacement, it will carry approximately 2,900 tons of liquid cargo--believed to be the largest capacity for any craft of this type.

The firm of Kindlund & Drake, naval architects, prepared the basic design for the barge, which is scheduled to be completed about August 1, 1947. The craft will be of the conventional raked-end type but will incorporate advanced methods of longitudinal and transverse framing and other improvements.

* * * * *

TANKER FLEET TO GROW

With more oil being consumed by Americans than ever before, and with the two war-built pipe lines between Texas and the eastern coast now transporting natural gas, the nation's tanker fleet becomes more than ever important to our economy, according to the American Merchant Marine Institute.

Unlike other phases of America's domestic shipping, the majority of tanker operations along the United States coastline is now carried on under private house flags. Government operation, still a large factor in all trades, will cease on July 1.

* * * * *

SHIPPING PROBLEMS DISCUSSED

Additional legislation to implement provisions of the 1946 Ship Sales Act is desirable, but no substantial changes in the 1936 Merchant Marine Act are needed, the Senate Interstate & Foreign Commerce Committee was informed by Vice Admiral Smith, Chairman of the Maritime Commission. Admiral Smith and other members of the Maritime Commission met in closed session with the Senate Committee for a general discussion of maritime problems.

* * * * *

NORMANDIE DESIGNER HOPES TO SALVAGE HER

Vladimir Yourkevitch, designer of the former French liner Normandie, is attempting to save his masterpiece from the scrap heap. Lipsett, Inc., has already stripped about ten thousand tons of steel from her bow and stern. Mr. Yourkevitch disclosed that he has drawn plans for a shrunken version of the 84,000-gross ton liner. He also has interested the French government, which has sent Philippe Deros, an adviser to the merchant marine ministry, to investigate the scheme.

* * * * *

HOPE FOR DOMESTIC TRADES

"We hope that, by the end of our operating authority on July 1, we shall be able to restore all of the domestic trades to private hands so that at least the minimum requirements of adequate service in each trade will be assured. The restoration of fully adequate service in each trade must necessarily depend upon the return of more normal economic conditions and the readjustment of postwar operations to meet postwar conditions."

Adm. W. W. Smith to John R. Steelman, March 24

The "domestic" trades referred to are Intercoastal,
Coastwise, and Alaska--Ed.

Fred L. Doelker, vice president of W. R. Grace and Co., acknowledging certificate of commendation presented to his firm by Brig. Gen. N. H. McKay, commanding general, San Francisco Port of Embarkation. Seven stevedoring and terminal operations firms having Army contracts at San Francisco and Los Angeles similarly honored. In addition commendations were presented civilian members of the Port Stevedoring Committees of the two ports.

Army Transportation Provides Big Business for Maritime Industry

By LT. COLONEL JAMES E. SULLIVAN, T. C., O. R. C.

IT MAY COME AS SOMETHING OF A SURPRISE to some readers that the United States Army is one of the biggest and best customers of the Pacific Coast maritime industry.

Everybody was aware that in wartime virtually 100 per cent of the facilities, shore and marine, of the merchant marine were devoted to the movement of military personnel and supplies.

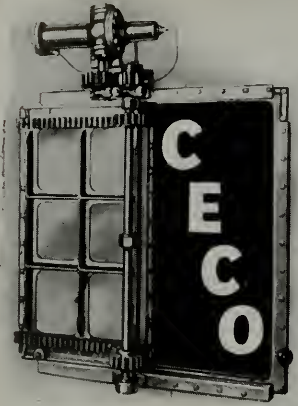
With the advent of peace when the commercial firms turned back to their normal channels of trade and commerce, they found that much of their work was still with the Army.

For it is the policy of the Army Transportation Corps, the warborn agency which consolidated all Army water, rail and highway transportation, to contract with private firms for as much work as can feasibly be done by the private interests.

This has resulted in much new business for many long-

(Please turn to page 118)

Left to right: Captain Gordon Jones secty., Jones Stevedoring Company; Captain O. W. Pearson, vice pres., Marine Terminals Corporation of Los Angeles; George Schirmer, pres., Schirmer Stevedoring Co.; Brig. Gen. N. H. McKay, Commanding San Francisco Port of Embarkation; Joseph Gallagher, vice pres. and gen. mgr., West Coast Terminals, Inc.; Col. John Kilpatrick, supt., Water Division, SFPE; Captain Chris Clausen, 2nd vice pres., California Stevedore and Ballast Co.; Christopher Redlich vice pres., Marine Terminals Corp.; Fred L. Doelker, vice pres., W. R. Grace and Co.; Ellett Norseman, pres., Marine Terminals Corp.; Roland Stevens, vice pres., International Terminals, Inc.; Don E. Kokjer, W. R. Grace and Co.



Keep Posted

New Equipment and Literature for Yard, Ship and Dock

A Hand Vise that Holds Small Pieces

To make handling of small parts and pieces easier and safer for both bench and production jobs, the Chicago Tool and Engineering Company has introduced a new aluminum hand vise which grips solidy, yet will not mar or scratch the work. Only 7 oz in. weight and 5 in. long, it is light and comfortable to hold. The 1½" wide jaw faces, which open to 1½", are accurately machined to provide a true surface. Made of aluminum, they are sufficiently softer than most pieces held to provide a "Velvet Grip" that prevents the jaws "biting" or marring the work. Known as the Palmgren No. 15 Hand Vise, it is ideal for use by tool and die makers, manufacturing jewelers, metal and wood workers, machine manufacturers, repair, school and home workshops and others handling any small pieces.

New hand vise that holds small pieces securely.

Ets-Hokin's Own Radiophones

The new line of marine radiotelephones have been introduced by Ets-Hokin & Galvan, and enthusiastic reports have been received from owners who have already had them installed. The new sets embody a small unit installed at the antenna and called the "Fulwat Coupler."

Maurice Antoine, Ets-Hokin & Galvan's radio engineer, explains its operation as follows: "The output of a ten watt transmitter is obviously ten watts, but the great difference in performance is that the output of the antenna, not the transmitter, is what pays off in performance. Various losses due to installation difficulties often cut antenna output down to three or four watts. The Fulwat Coupler is designed to cut down these losses, no matter where the actual transmitter is located. On the installations already made, actual antenna outputs of better than nine watts have been obtained. This accounts for the spectacular distance and clarity obtained even with the little ten watter."

The receiver is guaranteed to pick up a signal as weak as 2 microvolts (one two-millionth). Receiver and transmitter operate on four channels, appear to be very well built, and are specially designed so secondary ground circuits cannot cause electrolysis.

The new EH&G units are available now at the seven Ets-Hokin & Galvan stores, and new dealers are being appointed to take care of expanded production.

Hot Off the Press

A NEW 12-PAGE BOOKLET, "The Story of Aluminum Ladders," has just been published by the Aluminum Ladder Co., Worthington, Pa. Profusely illustrated, the booklet, in addition to giving information about the innovation and development of aluminum ladders, describes a number of the company's products for the fire, marine, dairy, aviation and general industrial fields. The Aluminum Ladder Co., original manufacturers of aluminum ladders, will forward copies of the new booklet on request.

WESTINGHOUSE BOOKLET COVERS MAGNETIC CRANE CONTROL. Five types of a-c magnetic crane controls for handling any type of load are described in a new 20-page booklet (B-3853) announced by the Westinghouse Electric Corporation.

The booklet contains descriptive information, wiring diagrams, performance curves and an application guide to aid in selecting the type of a-c control best suited to any application.

* * *

CATERPILLAR LINE IN ACTION, a new 16 page color booklet (Form 9782) describing and illustrating many of the diversified types of work performed by Caterpillar Tractor Co. products.

As the title indicates, the publication stresses applications of the entire line—diesel-powered track and wheel-type tractors, diesel motor graders, diesel industrial and marine engines and electric sets, bulldozers, scrapers, cable controls and wagons.

* * *

NEW RELIANCE MOTOR BULLETINS: Two recent bulletins on Reliance "Series C" induction motors have been published by The Reliance Electric and Engineering Company, Cleveland, Ohio. Bulletin C-118 covers protected (open type) frame sizes 203 to 326, with hp ratings from ½ to 20 hp, 600 to 3600 rpm. Construction details are described.

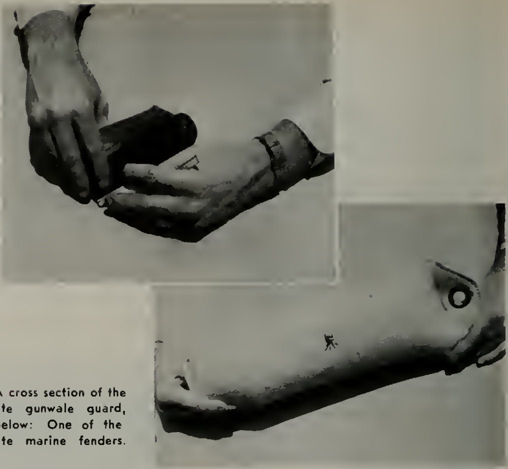
Totally-enclosed, fan-cooled "Series C" motors are described in Bulletin C-125, which deals with squirrel-cage frame sizes 224 to 326, for two and three phase a-c circuits.

* * *

THE ILLINOIS TESTING LABORATORIES, INC. of Chicago, has recently published Bulletin 4361 on Alnor Pyrometers. These pyrometers are of exceptionally rugged construction, designed to withstand severe service conditions. Ideal for measurement of diesel engine exhaust temperature and for general industrial use on air preheaters, superheaters, heat treating furnaces, oil quenching tanks, cyanide pots, bake ovens, diesel engines, die casting machines, feed water heaters, condensers and similar equipment.

B. F. STURTEVANT COMPANY, division of Westinghouse Electric Corp., has recently issued a new booklet telling the story about the latest developments in engineered air for modern merchant and naval vessels. It shows what "air at work" can do to boost power plant efficiency, protect perishable cargoes, and improve cargo-handling methods.

C. H. WHEELER OF PHILADELPHIA recently published specifications of the Tubejet air ejectors with combined surface type inter-after condenser. The folder, Number 81, gives general description of the air ejectors, with an illustration and diagrams. The operation and construction features are fully explained. Copies obtainable from Thomas S. Ryan, C. H. Wheeler representative in San Francisco (Rialto Bldg.).



Top: A cross section of the Shipmate gunwale guard, and below: One of the Shipmate marine fenders.

Marine Fenders by General Petroleum

With government restrictions regarding rubber modified, General Petroleum is now marketing its "Shipmate" marine fenders and gunwale guards.

Especially designed to "take the bumps out of boating," the new Shipmate fender is constructed of a one piece resilient sponge rubber, which is vulcanized to a smooth, seamless, one piece wick cover.

The Shipmate gunwale guard, extensively used by the Army and Navy, has a new non-collapsing rubber core. This exclusive feature insures its remaining in place; thus, it can not stretch and become loose.

WESTINGHOUSE ANNOUNCES THREE BOOKLETS FOR MARINE INDUSTRY: Diesel electric, geared-turbine and turbine electric—are covered in a recently completed series of booklets for ship operators, marine architects and shipboard engineers announced by the Westinghouse Electric Corporation.

Explanations of the construction and operation of diesel electric drives are contained in a 52-page booklet (B-3495). Services for which this type of propulsion is particularly suited and the basic principles by which it functions are outlined. The booklet contains a detailed list of marine installations, including tugboats, twoboats, ferries, dredges, tankers, cargo vessels, fireboats, yachts, ice breakers, minesweepers, cutters, survey vessels, and salvage ships.

"Westinghouse Geared - Turbine Propulsion" (B-3497), the second booklet in the series, contains descriptions of modern turbine propulsion, gears and auxiliary equipment. Included are several pages on operation and maintenance and a two-page discussion of the effect of pressures and temperatures on fuel economy.

The third booklet (B-3308-A) describes the arrangement, general design, operation and care of turbine-electric propulsion equipment. It also includes installation photos and numerous diagrams and cutaway drawings. A double page diagram shows the complete turbine-electric propulsion system.

Copies of the booklets may be secured from P. O. Box 868, Westinghouse Electric Corporation, Pittsburgh 30, Pennsylvania, or by writing to this magazine.

NEW LESLIE PUMP GOVERNOR BULLETIN 463, a new 16 page illustrated booklet giving engineering, operating and maintenance data on pump governors for control of reciprocating, turbine and motor driven pumps, has just been issued by Leslie Co., Lyndhurst, New Jersey, manufacturers of regulators, controllers, strainers and whistles.

Turco's New Non-Inflammable Tank Cleaner

Faster and more thorough stripping of carbon, paint, varnish, adhesive dirt, oil and grease from automotive and aircraft engines and parts is now possible with a new, non-inflammable cold tank cleaner, according to the manufacturer, Turco Products, Inc., Los Angeles.

Turco's non-inflammable cold tank cleaner.

In comparative tests this new cleaner, called Turco Transpo, has been shown to clean faster than any other known product of its type, the manufacturer states.

Turco Transpo is designed for operation at room temperature, being most effective and economical when it is used between 65° F. and 85° F. It is non-inflammable and made virtually odorless through a liquid seal which also protects the life of the compound and assures its continued operating efficiency. Transpo is non-corrosive to aluminum, magnesium, cadmium plate, steel, zinc, cast iron, and tin-plate.

Charles Bruning Company, latest product, the BW model 91, volumatic printer developer.

New Type Connector Makes Pigtail Splices

The Aircraft-Marine Products Inc. of Harrisburg, Pa., have manufactured a new solderless fixture type splicing connector which is called the Plasti-Grip closed-end connector.

This AMP connector, furnished with insulation attached, makes a permanent, insulated splice with a single operation of the AMP hand tool or press die without the necessity of soldering, wire twisting or taping. The insulating sleeve extends beyond the metal barrel of the connector, completely covering and protecting the ends of the wire insulation.

Pigtail splices can be made that will not loosen, even under the conditions of continuous vibration encountered in electric fan motors and appliance motors. The small size of the AMP closed-end connector is of particular advantage where space is restricted.

New Turco emulsifying agent increases safety and efficiency of petroleum in wide range of uses.

Mulsirex, New Product By Turco

Marketed under the trade name of Mulsirex, a new emulsifying agent designed for use with kerosene and other petroleum cleaning agents to insure greater safety, efficiency and economy has recently been introduced by Turco Products, Inc., of Los Angeles.

Mulsirex is recommended for removing very heavy deposits of oil and light grease from all kinds of metal parts and equipment. In solution with petroleum cleaning agents, Mulsirex adds to the cleaning potency of rhese agents through its deep penetraring qualities and, at the same time, because of its remarkably high flash point (180° Fahrenheit), greatly increases the margin of safety for the operator.

Flexible Luminous Tubing

A highly flexible, luminous tubing, originally produced for specialized wartime use, offers interesting possibilities for peacetime applications. Made by the United States Radium Corporation, the tubing comprises a tough, semi-transparent, moisture- and acid-resistant plastic, 1/4" O.D. and 3/16" I.D., uniformly coated on the inside with a radioactive material which is clearly and continuously visible at a considerable distance in complete darkness.

New Line of Worthington Rotary Pumps

A new line of general service rotary pumps, the GA Rotary type, has been introduced by Worthington Pump and Machinery Corporation, Harrison, New Jersey. Six sizes are available in various mountings for capacities up to 51 gpm and 100 psi.

These small capacity rotary pumps have been designed for durability under severest service requirements. Built-in pressure lubrication eliminates all external lubrication and the danger, prevalent in many industries, of liquid contamination. A production line item, the GA Rotary in its simplicity of design also offers easy maintenance and low first cost.

Models are available footmounted or flange mounted with adjustable stuffing box and mechanical seal. They are also available with or without oversize unloader type relief valve. All models are suitable for direct coupling to electric motors of any make. Marine uses include fuel oil service and transfer, lubricating oil service, bilge on small craft. Ask for Bulletin W-484-B1.

GA Rotary Pump, Worthington Pump and Machinery Corporation.

Kidde Offers New Marine Safety Equipment

Another new development, the Multijet nozzle, has been introduced on the market by Walter Kidde & Company, Inc. of Belleville, N. J., and is designed simply and function-

Cut me out and send me in

PRODUCT____________ Page No.________

PACIFIC MARINE REVIEW

KEEP POSTED

The details of new equipment or the new literature announced in this department will be furnished without obligation on your part. For quick service please use this coupon.

I saw this in your Month________ Year________ issue.

NAME____________

COMPANY____________ Please Print

STREET____________

CITY, STATE____________

YOUR TITLE____________

ally to provide a greater volume of fire-killing carbon dioxide gas, making increased efficiency of fire protection for boats. The nozzle has more range, less velocity and less turbulence than the standard shielded nozzle heretofore used. So great is the new "punch" that fewer nozzles of the multijet type are needed. For instance, the 35-pound system formerly required 4 nozzles. The same system will now be installed with only 1 nozzle.

Some features of the new system are:

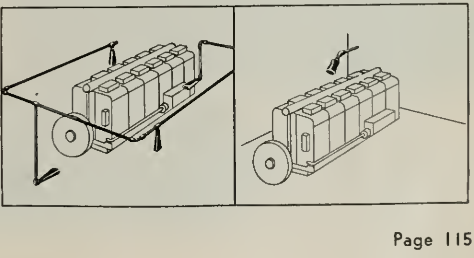
1. No external parts subject to fouling since manual controls are totally enclosed.
2. Very little force needed to operate manual systems due to exclusive feature of pilot port operation.
3. The automatic system provides instant protection at all times. Enpendent of any outside source of tirely self-contained, it is indeenergy—will function when batteries have been removed or when boat is laid up in "dead" condition btween seasons.
4. Remote control enclosed release and automatic systems fitted with reserve local control.
5. Smaller capacity system (10 lb., 15 lb., 20 lb., and 25 lb.) used a newly-developed, cold-drawn, lightweight cylinder, many pounds lighter than prewar types.
6. Accidental or malicious operation is prevented since conrrols are fitted with pull-out pin and seal wire.

In addition to built-in systems for marine fire protection, Kidde manufactures portable carbon dioxide fire extinguishers for motorboats in 4, 10 and 15 pound sizes which carry the approval of the Merchant Marine Inspection Service of the U. S. Coast Guard. These portables kill small blazes in flammable liquid and electrical equipment, work quickly and simply and are operated by means of an easy-to-use finger controlled trigger valve.

Ets-Hokin & Galvan Appointed Liquidometer Dealer

The Liquidometer Corporation of Long Island City has appointed Ets-Hokin and Galvan, 551 Mission Street, San Francisco, as their dealer in the marine field for the state of California.

Ets-Hokin and Galvan is now ready to fill orders for any of the various types of direct and remote reading fuel and water level indicators that the Liquidometer Corporation manufactures. In addition to this company's complete line of modern, efficient, easy to read dial type tank gages, Ets-Hokin and Galvan will also distribute Liquidometer's new simplified electric rudder angle indicator.



Artist's sketch of old and new Kidde fire protection system, shows how piping and fittings have been simplified and installation made easier by use of the new Multijet nozzle.

LEFT: Harry Engvall, chief engineer of the Helical Gear Dept. of DeLaval Steam Turbine So.
CENTER: Harold V. Rasmussen, chief engineer of the Turbine Department.
RIGHT: Hans Gartmaum, chief engineer of the Centrifugal Pump and Compressor Dept.

Appointments

DeLaval Engineering

Harry Engvall has recently been appointed chief engineer of the Helical Gear Department of the De Laval Steam Turbine Company, Trenton, New Jersey, with whom he has been associated for 23 years. He is a member of the American Society of Mechanical Engineers and the Society of Naval Architects and Marine Engineers.

Harold V. Rasmussen has been appointed chief engineer of the Turbine Department. He has been associated with De Laval since 1941. Before coming to De Laval, Mr. Rasmussen was connected with the Westinghouse Electric Corporation from 1922-1941, first as a design engineer on industrial and central stations and marine turbines and later as manager of Development of Land and Marine Turbines. He is a member of the American Society of Mechanical Engineers.

Hans Gartmann has been appointed chief engineer of the Centrifugal Pump and Compressor Department. He has been associated with De Laval since 1924, first as a designer of centrifugal pumps and compressors and later as a hydraulic engineer. Mr. Gartmann is a member of the American Society of Mechanical Engineers and chairman of the Trenton Section.

"Appointment? No—I just stopped in to read Pacific Marine Review."

More Work for Commander Leahy

Commander Frank W. Leahy, USCGR, Coast Guard Representative in Germany and Chief of the Vessel Inspection and Waterways Security Section, Transport Division, Office of Military Government for Germany (US) Berlin, was recently assigned additional duties as Chief of the Rhine Transport Organization which is responsible for the supervision of the German organizations in charge of Rhine River operations and engineering.

Commander Leahy, a former marine engineer and a native of San Francisco, sailed for some time in his youth with the Old Pacific Mail. His last assignment to San Francisco was Principal Traveling Inspector, Bureau of Marine Inspection and Navigation. At the beginning of World War II, he joined the Coast Guard and served as aide to Rear Admiral E. D. Jones, then Pacific Coast Coordinator of Coast Guard activities, and also headed the Coast Guard Vessel Security Section.

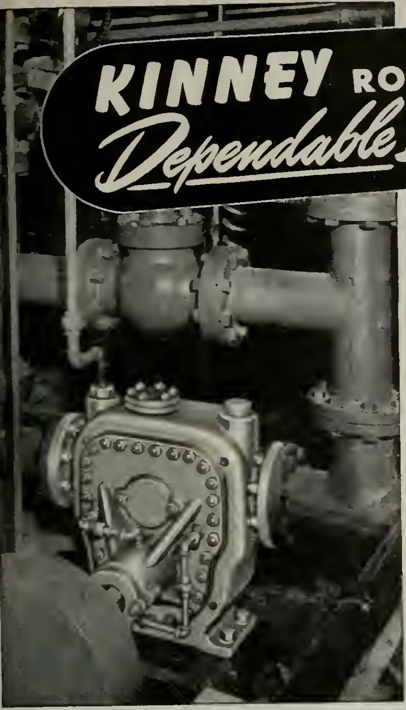
APL Training Program

To provide experienced personnel for the Company's expanding postwar services to the Orient and Around - The - World, President Henry F. Grady of American President Lines announces inauguration of a company training program for qualified young men who wish to make a career in America's merchant shipping industry.

The training program will be under the direction of Donald S. Campbell of the Industrial Relations Department, but will have close supervision of the company's Executive Department, Grady said, adding:

"Our objective is to train a limited number of properly-qualified young men for positions anywhere in the organization.

"After completing a ten-months' indoctrination in the various departments of the home offices in San Francisco, they will be assigned to sea duty on the Purser's staff for a period of from two to four years.



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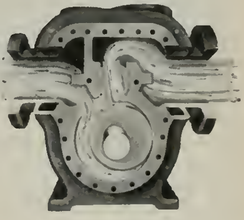
THE SIMPLE DESIGN of the famous KINNEY SD Rotating Plunger Pump with wide open passages permits the unobstructed flow of molasses, edible oils and petroleum products including asphalt — almost any material that will flow through a pipe. Two plungers set 180° apart give continuous flow and eliminate foaming. The pump has no valves, springs or gaskets and only one stuffing box. Displacement is positive — the pump is accurate as a meter and through the years retains its high capacity. Many KINNEY SD Pumps have been continuously on the job for over 25 years. Available plain or steam jacketed.



Cutaway view of SD Pump showing flow

Write for Bulletin 18A

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Army Transportation Provides Big Business For Maritime Industry

(Continued from page 109)

established firms and has given some new ones a flying start.

Army-initiated shipments are moving in commercial bottoms at a steady rate from four major ports—San Francisco and Los Angeles through the co-ordination of the San Francisco Port of Embarkation, headed by Brig. Gen. N. H. McKay; Seattle and Portland through the direction of Seattle Port of Embarkation commanded by Colonel Wm. H. Donaldson, Jr.

For San Francisco alone the monthly movement has averaged in recent months close to 300,000 measurement tons of outbound cargo alone. Fully 90 per cent of this was handled commercially.

More than 20 commercial ships a month move through the Golden Gate loaded with Army Supplies which the ship owners are moving under space and time charters negotiated with the Transportation Corps through the local Port of Embarkation. Five shipping firms hold such agreements.

But the Army contribution to the business of the Bay Area shipping industry doesn't stop with the movement of cargoes.

Much of the repair work on the Army's own ships, the transports and hospital ships used to carry military personnel, dependents and employees to and from the Pacific bases, is done in private yards. Through the winter, it was not uncommon to see five or six transports a week move into Bethlehem's yards or Moore's or Pacific Ship Repair Company, United Engineering, Consolidated Steel, Todd's, General Engineering or Graham's for repairs.

And Bethlehem, Kaiser at Richmond and Consolidated and Todd at San Pedro shared in the original conversions of the transports last spring from wartime troop carriers to peacetime transports, with increased accommodations for cabin class passengers and crews. Further conversions are planned and these too, will be done in the private yards.

On shore, too, Army terminal work is now being performed by private firms. Last summer the Port of Embarkation began turning the stevedoring activities at Oakland Army Base, Fort Mason and the San Francisco Embarcadero piers over to contractors. The complete turnover was effected in July and the Port retained only a supervisory control of this part of its operations.

Six stevedoring and terminal firms in the San Francisco Bay Area and two in Los Angeles are handling Army cargoes under these contracts.

In all these operations the wartime co-operation between the two big shipping groups—the commercial and the military—has been continued.

Evidencing this spirit of understanding and co-operation was the presentation recently by General McKay of certificates of commendation to the civilian members of the Port Stevedoring Committee, which handles all phases of stevedoring, terminal operations and allied activities concerned with the contracts. He also presented commendations to the eight stevedoring and terminal operation concerns.

The Port Stevedoring Committee for San Francisco consists of Col. John Kilpatrick, Superintendent of the Port Water Division, Chairman, and Clarence Higbee, Chief of Port Procurement Division, as Army member; Captain Gordon Jones, Jones Stevedoring; D. E. Kokjer, W. R. Grace and Co.; Christopher Redlich, Marine Terminals Corporation, San Francisco; and Joseph Gallagher, West Coast Terminals. Colonel Kilpatrick, Mr. Higbee and Captain O. W. Pearson, Marine Terminals Corporation of Los Angeles, from the Los Angeles committee.

The company awards went to W. R. Grace and Co.; represented by Fred L. Doelker, vice president, D. N. Lillivand, operating manager, and D. E. Kokjer, assistant to the manager; West Coast Terminals, Inc., represented by Joseph Gallagher, vice president and general manager; California Stevedore and Ballast Co., represented by Captain Chris Clausen, vice president and operating manager; Marine Terminals Corporation, represented by Ellett Horsman, president, and Christopher Redlich, vice president; International Terminals, Inc., Los Angeles, represented by Roland C. Stevens, vice president; Jones Stevedoring Company, represented by Captain Gordon Jones, secretary, and Marine Terminals Corporation of Los Angeles, represented by Captain O. W. Pearson, vice president.

The 14,000 barrel seagoing barge of Foss Launch & Tug Company hauling a cargo of lubricating oil from New Orleans to San Francisco.

Barging—New Orleans to Seattle

This 14,000 barrel seagoing barge recently purchased by the Foss Launch & Tug Company of Seattle, Wash. left New Orleans for San Francisco with a cargo of lubricating oil after being overhauled by Avondale Marine Ways, Inc., New Orleans. It is to be put into service in the Alaskan trade, according to the new owners who bought the barge on the Gulf Coast as war surplus. The barge is 210 feet over-all and has a beam of 40 feet. At the Avondale yard a 20-foot mast and 50-foot cargo boom, both constructed of six-inch pipe, were fabricated and installed; all pipes were tested, the hull cleaned and painted and the four diesels, which operate the generators, anchor windlass and cargo pumps, were put into condition.

World Trade and Sea-Air Operation

(Continued from page 82)

study and to cooperate with vessel owners in devising means by which there may be constructed express liner or super liner vessels comparable with those of other nations *especially with a view to their use in national emergency and the use in connection with or in lieu of such vessels of transoceanic aircraft service.*"

The 1938 Act, in section 401, requires the Civil Aeronautics Board to issue certificates to any qualified applicant, who is fit, willing and able to properly perform a service which is required by public convenience.

The question of whether shipping companies shall be permitted to participate in developing American-flag overseas aviation is far more basic than any issue between types of companies or between private interests. It is a question of national defense. A strong merchant marine of the sea and of the air is, by testimony of the highest civil and military authorities, a prime requisite of national defense. The soundness, adequacy and stability of both our overseas air arm and our surface shipping will be imperiled if either is straight jacketed by unnecessary restrictions or handicaps.

It is a question of public interest. The function of America's shipping companies is the carriage of persons and property over the ocean as efficiently and speedily as possible, whatever the means. Depriving them of the ability to use the latest and fastest transportation equipment would establish an arbitrary bar to progress and an impediment to service, to the injury of the public interest.

The transportation "know how" and facilities of American shipping companies are a national asset. These companies have created international networks of offices and staffs. They have spent huge sums promoting American flag transportation services. They have acquired wide knowledge of foreign trade, of customs and immigration procedure and of the intricacies and pitfalls of foreign competition.

Wouldn't it be pure folly to cast aside this national asset, and vest in a small group of newcomers to the field the sole and exclusive right to engage in overseas air transportation?

A coordinated service of surface craft and long range aircraft will be in effect a new and improved type of service offering many advantages to the traveller and shipper which neither surface nor air services operating independently of each other can provide. *It is a question of meeting foreign competition.* Our friendly competitors, the British, have adopted an overseas aviation policy providing full participation by Britain's shipping companies. The British White Paper on Air Transport presented in March 1945 states for example:

"The British Shipping Lines which have for so many years carried a large proportion of the passengers and trade between Europe and South America and have their wide connections and organization and their good will in the areas to be served by the new air routes are, in the view of His Majesty's Government, in the best position to make the service a success."

The Dutch, the Swedes, the Norwegians and other maritime competitor nations propose to institute coordinated sea-air services—to compete for American patronage. This trend was brought pretty close to home just recently when an American built DC-4 Australian

Matson's "Royal Hawaiian"

Mrs. Carl Eastman, wife of the President of the San Francisco Chamber of Commerce, christening the Matson airliner, "Royal Hawaiian," at John Rogers Airport in Honolulu on Sunday, March 9, as native Hawaiian dancers, musicians and chanters look on. Standing beside Mrs. Eastman is Warren B. Pinney, director of the Hotels Division of the Matson Navigation Company, owner of the Royal Hawaiian Hotel on Waikiki Beach. Above, Captain Dwight A. Hansen of the airliner, looks on. Immediately following the christening, the airliner took off from John Rogers Field for San Francisco, carrying a delegation of San Francisco Chamber of Commerce members and officers who visited Hawaii on a good will mission. The departure of this group from San Francisco was pictured in the March Pacific Marine Review.

National Airways plane landed at Oakland Municipal Airport carrying 31 passengers. The landing completed a leg of the inaugural flight of a regular scheduled weekly service on an Australia-South Seas-Honolulu-Oakland Vancouver B. C. route—The ANA is owned principally by Australian shipping interests.

One of the principal owners is the Union Steamship Company, which for years has been the direct competitor on the Pacific Coast-Australasia run of one of the 11 American steamship companies mentioned before—the Oceanic SS Co.

There is an extremely interesting slant to the ANA situation. In January of 1945—more than two years ago—the Oceanic SS Co. filed a petition with the Civil Aeronautics Board in Washington, D. C., for a permit to operate regular scheduled air service supplementing its steamer service from S. F.-L. A. to Australia and New Zealand via Honolulu, Pago Pago and other South Sea points.—The CAB has not yet set a date for the hearing. The British Commonwealth representing the Australian National Airways filed application for permit to operate over virtually the same route and a hearing was held the very next day—the application approved—and ANA landed at Oakland on its inaugural flight over the route last month.

Another case in point is a full page color advertisement extolling the virtues of Banff and Lake Louise which appears in the February 24th issue of Life magazine. This ad is sponsored by the Canadian-Pacific and calls attention to the "package tour" facilities offered by that organization—railways, steamships, airlines, hotels and express. . . .

U. S. flag ships have over the past 100 years built up huge and efficient world wide organizations and have accumulated a wealth of hard earned experience, all of which is of the greatest importance in serving the public and in dealing in and developing foreign trade. In practically every civilized land they possess offices, experienced staffs and personnel, agencies, trade connections, banking facilities, and travel know-how. The knowledge of sources of overseas business, travel habits and preferences, immigration, tariff laws and regulations, and availability of administrative, sales, accounting, and maintenance organizations constitute a vast national asset in international trade, guaranteeing economies and efficiency in air trade and travel which have been and are being passed on to the shipper, traveller, and American business men overseas.

Yet at a time when world trade markets are reopening, when competition for foreign trade is internationally in sharp crescendo, when foreign air lines are already invading trade areas actually served by American ships, U. S. flag steamship lines today face the possibility of being excluded from the field of international air transportation. Such air routes are and have been certificated with one existing exception to the domestic air lines of the U. S. while foreign countries' steamship and air interests backed by their national government have been and are being certificated to fly to the U. S. on the basis of the bi-lateral treaty policy. Now this treaty policy is sound. This is merely a factual comment on the unfortunate result of the combination of the reciprocal aspects of the treaty and the concurrent failure to permit American steamship interests to participate in overseas air transport. Privileges are granted to foreign maritime interests which are not concurrently granted to their American counterpart thus permitting such foreign interests to gain control of carrying our trade to foreign shores.

We all know the history of American prestige in foreign trade in the clipper ship era when we controlled the largest percentage of foreign trade and carried it in American ships. With the advent of the steamship we gradually lost that control to foreign steamship interests largely because of the lack of national interest in the American Merchant Marine, until the time of World War I when the greatest percentage of our American goods were carried to foreign shores in foreign bottoms. This is the trade which America produced and America developed, but which was carried largely by foreign interests. During World War I it was necessary for this country to build, at great expense, the old work horse of the sea—the ungainly "Hog Islander"—and her counterparts—to carry the might of American arms overseas.

After World War I many of these vessels were left to rot or sold to foreign interests who gradually regained supremacy until the greatest percentage of foreign trade was again carried in foreign bottoms. So, here we go again. In World War II it was the Liberty and Victory ships, supplemented by the C-type of vessels, built at great expense overnight, operated by the American steamship companies that again carried the might of American arms to all shores of the globe. Now following World War II history threatens to repeat itself, and the American Merchant Marine finds itself in an untenable position, almost unable to operate ships because of increasing operating costs as against foreign competitors. Add to that—ships used during the war have to be reconverted and now, almost a year and a half after the end of the war, only a very few passenger ships are carrying American passengers overseas. Many of the war-built ships will again go to foreign owners.

You are probably wondering what, if anything, is being done to straighten out this situation to a point where at least American-flag overseas carriers are not

(Continued on next page)

World Trade and Sea-Air Operations

(Continued from page 121)

handicapped in their competition with foreign operators —particularly combination sea and air operators.

The Waterman Steamship Corporation owns and operates Waterman Airlines Inc., which flys a non-scheduled service and operates a scheduled intrastate service in Alabama. In addition it has developed a long range high capacity cargo plane designed expressly for Caribbean flight. During the war it conducted training courses for military pilots. Recently it purchased controling interest in the South American air line TACA.

The United Fruit Company operated the first public-service airline in Central America in the 1920's.

W. R. Grace & Company with interests in the Grace Line jointly pioneered the first air service to the West Coast of South America.

American Export Lines despite every discouragement established an air service, New York to Ireland, the only American competitor of Pan American Airways.

Locally the history of Matson Navigation Company's aviation activities dates back to 1929 when Matson took its first steps toward the eventual inauguration of air service between the Pacific Coast and the remote Hawaiian Islands.

A little more than two years after Colonel Charles A Lindbergh's historic flight to Paris in the "Spirit of St. Louis," Matson began a series of studies of the possibilities inherent in this new means of spanning the 2,500 miles of salt water which separate Hawaii from the mainland United States. In these studies Matson was joined by the Inter-Island Steam Navigation Company of Honolulu, which at the same time was moving to establish what is now Hawaiian Airlines, Ltd.

By 1934, the development of flying boats capable of making the long hop between the mainland and Hawaii was progressing rapidly, and in that year Matson was approached by Pan-American Airways with a proposal that the two companies join in establishing a trans-pacific air service. In 1935, Matson and Inter-Island entered into a contract with Pan-American by which the first two agreed to supply Pan-American with capital, act as agents and otherwise assist in setting up the first trans-pacific air transport service. Subsequently the Civil Aeronautics Board disapproved this contract, and the outbreak of war halted all planning until 1943 when Matson filed an application for permission to operate this service in its own name. Shortly after it applied for the right to operate air service from the Pacific Coast to Australia under the name of the Oceanic Steamship Company, a wholly owned subsidiary which we mentioned a moment ago. This Matson application sought permission to fly between Hawaii and the co-terminals Portland-Seattle, San Francisco and Los Angeles, but this application has been denied as to the San Francisco phase. The Los Angeles phase has not yet been definitely decided by the Board, but it held that no direct service between Hawaii and the Pacific Northwest was warranted by anyone.

Last September Matson filed a new application for permission to operate scheduled air service between the Pacific Northwest and Hawaii sighting the rapid postwar growth of trade and travel between these two areas. On this application a new hearing has been set for April 21 in Portland.

On July 1, 1946, Matson inaugurated non-scheduled direct air service between Pacific Coast points and Hawaii. You doubtless are familiar with the distinction between such non-scheduled service and certificated, scheduled service. Matson carried, and still carries, both passengers and cargo, utilizing converted Douglas DC-4's, the military version of which is called C-54. It converts, maintains and overhauls its own equipment. The latest plane in service, the Sky Matsonia, is considered perhaps the most magnificently appointed DC-4 in service anywhere. Flights have been made on a necessarily irregular basis between Hawaii and Seattle-Portland, San Francisco and Los Angeles.

Early in the war Matson undertook, by contract with the U. S. Navy, to operate a modification center for naval aircraft, first at Mills Field and subsequently at Oakland Municipal Airport. This work developed into the overhaul, maintenance and conversion of multi-motored aircraft for the Navy, employing at its war-time peak 800 skilled technicians, test pilots, and others. With the end of the war, Matson projected this activity into the commercial field and now operates one of the largest aviation overhaul, maintenance and conversion centers on the West Coast. This activity is carried on in three large hangars at the Oakland Municipal Airport, with a payroll of around 600 to 700 persons. Customers include several foreign governments, several non-scheduled operators such as the Flying Tigers, California-Eastern Airways; and domestic airlines including Pan American World Airways and Northwest Airlines. This activity has been set up on a permanent basis under a wholly owned subsidiary, the Matson Aviation Maintenance Company.

The problem is of vital importance at this very moment.

America now has the biggest and best maritime establishment in the world.

America has the productive capacity to *always* have the biggest and best maritime establishment in the world. But short-sighted American maritime and aviation policy could *very soon* and *very surely* reduce us to the condition of impotency in ocean commercial shipping that was our humiliating lot before the recent war.

World trade advantages will not be won by ship or plane operators alone, but by an American Merchant Marine assured of the conditions of operation which will equip it to hold its lead position in this era of international competition.

Pacific
WORLD
TRADE

Newport Beach, California

(Continued from page 66)

boats or sport fishing boats. Many boats operate as commercial boats in winter and are used for Sport fishing during other months.

COMMERCIAL FISHING

The value of the commercial fishing industry now is indicated in the table below.. Before the 1935-36 program was carried out the value of the Fishiing Industry was very small.

Year 1935	Weight Pounds	Amount paid Fishermen
Total Canning Fish, Newport Harbor	18,725,299	$467,500.00
Total Market Fish, Newport Harbor	1,179,858	354,401.00
Total Fish, Newport Harbor	19,905,157	830,901.00
No. Cases Canned,	162,892	
Value of Canned Fish		789,460.00

The assessed valuation of Pleasure Craft is about five and a half million dollars for 1946.

Total Cost of this harbor development to date was:

Newport Beach	$1,082,700
Orange County	1,206,700
Federal Government	1,098,800
Private Work	656,600
	$4,044,700

Purposes for which Money was Spent:

For Jetty Construction	$1,399,000
Dredging	2,498,700
Santa Ana River Diversion	147,000
	$4,044,700

Assessed valuation of the City of Newport Beach more than doubled during the decade following this harbor improvement.

Antigua Converted at Todds

UNITED FRUIT COMPANY'S turbo-electric liner, Antigua, rejoined the "Great White Fleet" cargo and passenger services about March 20, after complete reconversion at Todd Shipyards Corporation's Brooklyn Division. A considerable part of the work on the hull was the repair of bottom damage suffered in wartime service grounding. This involved: installation of 51 new plates; removal, repair and replacement of 13 plates; and repair and adjustment without removal of 32 plates.

Reconversion entailed removal of 20 mm. gun foundations, on the port and starboard bridges, removal of the "degaussing" system, 9000 cubic feet of concrete ballast and numerous deck and navigational structures of a purely military nature.

The docking bridge on the poop deck was rebuilt according to original plans.

The double bottom had extensive damage in grounding and considerable repairs were necessary to the floors, frames, tanks and piping. Machinery, boilers and engine rooms were thoroughly inspected and repairs made.

Throughout the passenger and crew accommodations reinstallation of equipment was in accordance with the highest American standards of safety. Paneling, deck coverings, fire doors all were refitted with a view to making the ship highly fire resistant.

The cargo hold coolers for the ship's fruit cargoes were extensively overhauled, with coils, fans and motors taken out for overhaul or repair or replacement of parts.

The electrical system was thoroughly revamped, repaired and replacements made where necessary, the ship's safety fire alarm system was overhauled and the telephone system restored to normal peacetime operative condition.

Detroit Diesel Factory's Model Parts Department

As an educational service to their distributors, the Detroit Diesel Engine Division of General Motors recently announced the opening of a model parts department at the company's factory in Detroit, Michigan. Attractively appointed and incorporating the features necessary for effective parts merchandising, the display provides a working model which supplies parts for Detroit Diesel Engine Division's service repair shop, and which may be easily and inexpensively copied by distributors in setting up their own parts distribution organizations.

A sixteen page booklet graphically illustrates the layout and shows in detail how it can be readily adapted to any existing operation of comparable size. Dimensions of working areas, sizes of bins, recommended materials, and suitable merchandise displays are all covered in detail.

Industrial Leaders Headed For San Francisco Marine Exposition

When Lloyd Fleming speaks at the opening of the National Marine Exposition in San Francisco, May 12, he will be vanguard of a distinguished group of speakers and visitors such as have seldom graced a Pacific Coast maritime gathering.

In addition to a late influx of space orders, reports of the coming visit of men important in shipping and manufacturing, are reaching local headquarters every day. Many of these visitors will take active part in the proceedings.

Among the latest visitors' names released are those of John F. Gehan, American Export Lines; O. B. Whitaker, Sperry Gyroscope Co.; Charles P. Pannill, president, Radiomarine Corp.; E. J. McMahon, national vice president, Propeller Club of the United States; George G. Sharp, naval architect; E. H. Price, vice president and general manager, Mackay Radio; O. D. Colvin and J. S. Carswell of Cargocaire; Robert E. Friend, F. H. Kilberry and R. W. Bayerlein of Nordberg; J. W. Jackman of Worthington Pump; and T. J. Bannon heading a delegation of 14 officers and managers of Western Gear Works.

The program—with a parade, an aerial show, an art contest, speeches, and a grand exhibition by the Maritime Commission, Navy and Industry—is sure to be highly informative to the public at a time when public good will for the Merchant Marine is vitally necessary. All who participate are performing a service for the industry as well as for themselves.

The "Brass Hats" at the President's Table at the Stag Dinner

ONE THOUSAND PROPELLER CLUB MEMBERS AND THEIR FRIENDS ATTENDED THE ANNUAL STAG OF THE PROPELLER CLUB. PORT OF NEW YORK

Reading left to right, upper row: Lt. Comdr. Arthur M. Tode, USN (Rtd.), Honorary President, The Propeller Club of the United States; Vice Admiral William Ward Smith, USN, Chairman United States Maritime Commission; Mr. Harmon Lewis, President, Propeller Club, Port of New York, and President, Alcoa Steamship Company.

Lower row: Admiral Thomas C. Kincaid, USN, Commandant Eastern Sea Frontier; Fleet Admiral William F. Halsey, Jr., USN; Vice Admiral Emory S. Land, USN (Rtd.) President, Air Transport Assn. of America.

Lloyd C. Fleming

Atlas Moves San Francisco Office

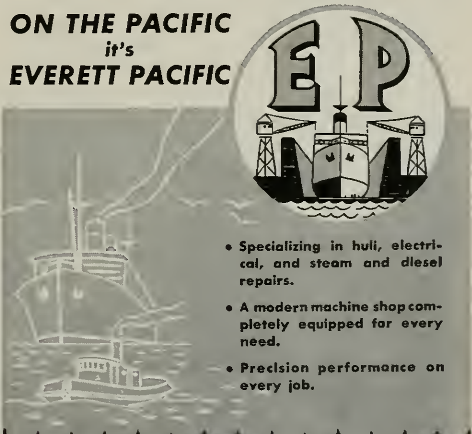
Atlas Imperial Diesel Engine Co. announces the opening of new headquarters in San Francisco at 512 Brannan Street and the closing of their former sales offices on the ground floor of the Rialto Building at 102 New Montgomery Street in the congested uptown district.

At their new location the company not only maintains sales offices and a large display room, but also parts storage and shop facilities for the repair of small engines, especially the Chrysler Marine Engines which Atlas distributes from Northern California to Alaska.

In charge of the San Francisco branch is J. H. Czock, assisted by John Jones. Ed Dunk is responsible for parts and service.

Interocean Changes at Los Angeles

Interocean Steamship Corporation, through Walter Wilkinson, district manager, announces the following additions to their staff: Phillips Seagrave has been appointed to the Los Angeles staff in charge of traffic. Robert Harding has been promoted to manager of the Intercoastal Department. Alvin Colflesh has joined the Los Angeles staff as chief clerk in charge of documents.


E P

President Johnson Reconverted for Portugal-South America Run

(Continued from page 59)

all complere ocean equipment and boat gêar were also supplied by the Welin Company.

All main propulsion machinery, boilers, and complete auxiliaries had to be thoroughly examined, completely overhauled, and all necessary replacements made, including one new section of crankshaft for starboard main engine. This job constituted one of the major portions of the contract. Due to the extensive changes in the ship's accommodations, considerable plumbing and electrical work also had to be done.

All work was performed in accordance with the general rules and regulations prescribed by the Board of Supervising Inspectors of the United States, and the vessel maintains her class in the American Bureau of Shipping.

The total sum involved in the contract was considerably over one million dollars, and as a result of the close cooperation between the management and labor, the General Engineering and Dry Dock Corporation's contract was completed in the remarkable time of 38 days. PRESIDENT JOHNSON STORY THE END

The following vendors supplied their equipment as shown:

Boats and Davits, Welin Davit and Boat Corp.; Complete Radio Equipment and Direction Finder, Mackay Radio and Telegraph Co., Inc.; Furniture and Draperies, K. H. Lengfeld, San Francisco; Tabletops and Public Rooms, Formica Insulation Co.; Asbestos Coverings, Plant Rubber Co., San Francisco; Linoleum and Rubber Tile, Armstrong Cork Co.; Magnesite Cement and Hard Tile, William Lee Co., San Francisco; Public Address System, Stromberg Carlson Co.; Paints, International Paint Co., Inc., W. P. Fuller & Co., Paraffine Co.

All tanks, Engine and Fireroom cleaning was done by Sopac Ship Maintenance Company, San Francisco. The complete electrical installation and all loud speaking equipment were efficiently handled by the Republic Electric Company of San Francisco.

Ingalls Completes Moore-McCormack Fleet

SS Mormacsaga, last of a fleet of seven modified C-3 type vessels to be built by The Ingalls Shipbuilding Corporation at its Pascagoula, Miss., yard for Moore-McCormack Lines, has been delivered to her owners, officials of the shipbuilding corporation announced recently.

Acceptance of this ship completes a $21,000,000 construction program at Ingall's yard, involving four ships for Moore-McCormack's American Republics Lines to the east coast of South America and three for the company's American Scantic Line service to Scandinavia and Baltic ports. The Mormacsaga was scheduled to make her maiden voyage to Scandinavia last month.

Each of the seven postwar all-welded ships is 492 feet long and has a displacement of 17,600 tons. They each have accommodations for 12 passengers and 70,000 cubic feet of refrigerated cargo space.

In addition to these seven vessels, Moore-McCormack is also in the process of acquiring four ships from the Maritime Commission, including the Ingalls-built William Harris Hardy, a war vessel, to be renamed the Mormacrio.

President Johnson as Army Transport, taken in dry dock in Seattle.

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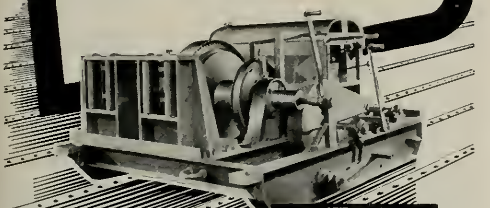

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California and the American Merchant Marine

(Continued from page 64)

shape, and there must be a full realization by users of our domestic transportation and Government that this problem must be solved or we must inevitably look to nationalization of our entire domestic transportation system.

To assure itself of economical and adequate distribution, American industry must support a competitive domestic transporation system in which all types of carriers can participate and develop with a fair return for investment and effort. Industry and agriculture cannot provide its own distribution. For its own interests, it must see to it that the providers of such service are able to operate in a healthy economic climate.

Another problem that has most serious implications is the present attitude of certain American maritime labor leaders.

It is customary for these few men to speak of the shipowners as "our enemies" and to instill within the rank and file of their membership the thought that the shipowners' objective is a single one, designed to make profit at labor's expense. The shipowners' objective, like that of any other businessmen, is to operate efficiently and prosperously, providing at once an economical service and the greatest possible number of good jobs at good pay.

Shipping's job is to instill in the rank and file the knowledge that we have a strong interdependence. We lack—but want and should have—the enthusiastic loyalty and support of the men who load and who sail our ships. The shipowner also wants and is entitled to have a full day's work for a full day's wages.

But what can all Californians do about the Merchant Marine? Like any other national asset such as iron ore, petroleum, or manufacturing and farming, railroads and airlines, the American Merchant Marine deserves the careful thought and consideration of all Americans.

This country must boldly step out in trade as well as in the moral leadership of our shrinking world. If trade is at the heart of American relationship to the rest of the world, then it can well be said that shipping is equally at the heart of trade.

Let us not make the mistake of thinking that our Merchant Marine problem is one for Congress, the Maritime Commission or the shipping interests alone. They can succeed only in so far as they have the active support of all the American people.

Regardless of your business or activities, you can do something about keeping our Merchant Marine alive and strong in peacetime.

You can support future legislation of the type of the Merchant Marine Act, designed to insure a strong Merchant Marine, active in foreign trade and carrying its fair share in the domestic trades and adequate for national defense.

You must encourage and promote a two-way foreign and domestic trade by American ships. If you are a manufacturer or distributor, give first consideration to shipping goods abroad in American ships and give the domestic lines a fair break in tonnage distribution. If you travel outside the country, travel in American ships. In respect to their own lines, foreigners follow these practices religiously and it seems a sad commentary that such cooperation has been lacking for our own ships.

In conclusion, rough going seems to lie directly ahead for shipping. When you read, see, or hear of our problems, we ask your cooperation, your support and sympathetic understanding. Shipping knows California's stake in the American Merchant Marine, and in a large sense, our problems are California's.

We have most of the ingredients of a great merchant marine now. If given the opportunity, it can and will perform an indispensable service to all Americans. Let's keep it, improve it, and use it to help maintain our own standard of living and to improve those of the rest of the world.

A Supercargo's Life 1556 A. D.

(Continued from page 92)

Nicholas to see if there be any goods left in the said storehouse; if there be you shall demand why they be not laden, and to note what kind of goods they be that be left, and seeing any of the ships there not fully laden you shall put the agent in remembrance to lade these goods so left, if any such be to be laden, as is aforesaid. And thus, God sending you a fair wind, to make speed and away.

12. Finally, when God shall send you to arrive again upon this coast in safety, either at Harwich or elsewhere, go not you ashore, if you may possible, to the end that when you be gone ashore there may be no goods sent privily ashore to be sold, or else to be sold aboard the ship in your absence, but keep you still aboard if you can by any means for the causes aforesaid, and write the company a letter from the ship of your good arrival which you may convey to them by land by some boy or mariner of the ship or otherwise as you shall think best, and likewise when God shall send you and the ship into the river here, do not in any wise depart out of the ship that you be in until the company do send some other aboard the ship in your stead and place, to keep the said ship in your absence.

An Engineer

An engineer is a person who passes as an exacting expert on the basis of being able to turn out with prolific fortitude infinite strings of incomprehensible formulae, calculated from the results of inconclusive experiments of problematical accuracy by persons of doubtful reliability and questionable mentality for the avowed purpose of annoying and confounding a hopelessly chimerical group of exoteric fanatics referred to altogether too frequently as practical men.—From *American Engineer.*

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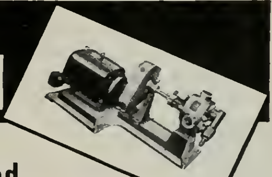

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Admiralty Decisions

(Continued from page 85)

writing vague general ideas to business corporations and then seizing upon some later general similarity between their products and the notions propounded as a basis for damages. Such schemes are quite different from the situation envisaged in the *Bristol case, supra,* and this case. Here the relationship between the parties before and after the disclosure, the seeking of disclosure by Furey, Furey's promise of compensation, the specific character, novelty, and patentability of plaintiff's invention, the subsequent use made of it by defendants, and the lack of compensation given the plaintiff—all indicate, the court said, that the application of the principle of unjust enrichment is required.

Defendants also made the argument that there was no proof of Furey's authority to make the contract as originally alleged and also claiming like lack of authority to accept the benefit of plaintiff's idea to the extent of making defendants liable. It must be remembered that the instant case was tried before a jury and the question of authority was within their province as a question of fact.

The other question raised by defendants was the claim of lack of proof of damages. The judge charged the jury that they must find for the plaintiff, if they determine that he is entitled to recover, upon the "reasonable value of the use" of the devices and the "reasonable value of the services" rendered by the plaintiff. There was considerable evidence produced by the plaintiff showing that man hours saved as the result of his devices were sufficient in and of themselves to result in approximately a $50,000 saving to defendants each year on each pier. There were so many other items of saving that were difficult to properly assess in dollars and cents saved that the court determined, after a rather complete review of the evidence of damages that, under the evidence introduced at the trial, the damages ultimately awarded were not excessive in the case. The jury's verdict was, of course, affirmed.

Flare-Up of Latent Conditions

There is nothing peculiar, I suppose, about the conclusion that one will find in State Court decisions, as well as Federal, almost every type of situation sounding in tort to the effect that "You take a blind man as you find him." In other words, it is not a substantial defense to maintain that a man has certain disabilities that make his present condition more serious where the tort-feasor's negligence intervented.

In the case of *Francis vs. Seas Shipping Company,* 1947 A.M.C. 57, the defendant appeals from a judgment recovered by plaintiff under the Jones Act for injuries suffered through the defendant's negligence, in addition to recovery of maintenance and cure. In June 1942, the plaintiff signed articles as a petty officer messman on the Steamship TUXFORD with the duty to serve five men and make up six bunks. He was also assigned as a loader of one of the guns on the port side forward; that is, to hand the shell to the man who was to put it in the breech. He was instructed to drop whatever he was doing and proceed to his gun position as best he could in case of an air raid alarm.

On the morning of August 6, while the ship was at Suez and Arab stevedores were unloading cargo and the plaintiff had completed his duties and gone to his bunk, an alert was sounded. He at once came out of his quarters and started to run to his gun position but found he could not do so because the passageway from his bunk to the gun position which was some 175 feet was littered with planking, dunnage, a chain and some rope, strewn about in a disorderly fashion. Steel hatch covers also lay on the deck, not evenly on top of one another but at angles. As he proceeded he tripped over the dunnage and then slipped on hatch covers, fell down and injured his right ankle. When he picked himself up he again hit his ankle on one of the hatch covers which he had to climb over. Upon finally reaching his gun position he felt so much pain in his ankle that after ten or fifteen minutes he had to be replaced by another seaman. Returning to his bunk he found his ankle black and blue, scratched and swollen. During the remainder of the voyage he was relieved from his duties and upon return to the mainland he was required to undergo an operation at the Boston Marine Hospital consisting of the cutting of certain nerves in his ankle. Thereafter he was required to use a cane and had considerable difficulty holding down any position. In December, 1945, he was obliged to stop working permanently.

The evidence revealed that at the time of the operation approximately six months following the injury, it was discovered that plaintiff had Buerger's disease, which is an inflammation of the arteries, veins and nerves of the extremities. Testimony was introduced through medical specialists to the effect that the particular accident suffered by the plaintiff was sufficient to aggravate the aforesaid disease.

There was considerable evidence indicating that the ship's deck and particularly the area through which plaintiff was required to travel in order to reach his gun station was clogged by large beams and dunnage in addition to sundry other articles, making it difficult to make one's way with reasonable safety. The jury, after receiving the court's instructions, found that these circumstances constituted a negligent condition aboard the vessel. The court follows and repeats in its decision the conclusion of the Sieracki case in which is was held that the duty of the defendant to furnish the plaintiff with a safe place to work is a non-delegable duty.

In this case the plaintiff was perfecty able to do full work even though he was suffering from Buerger's disease and, therefore, the reviewing court holds that his damages should be considered upon the basis of his being fully capable of carrying out his particular line of endeavor prior to the injury and being separated from that opportunity as a result of the injury.

Another interesting point covered by the decision is the oft repeated rule that one cannot complain of excessive damages in the reviewing court where there has not been any error in law in reaching the amount. If the amount is excessive, the defendant's remedy is by motion in the trial court.

The judgment was affirmed in the instant case.

Pacific MARINE REVIEW

MAY, 1947

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By B. H. Boynton

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Pacific
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REVIEW

We Depress Too Easily!

NOT SO VERY LONG AGO there was a great deal of criticism of those who worried about postwar planning. It would interfere with the war, and most of the country went along with that theory. We put forth an almost incredible effort, and emerged with greater wealth, greater potential opportunity, and an almost unscathed land. The price was a fearful one, but there are lasting benefits. And postwar planners are now credited with great foresight.

Among the benefits, there has come a new appreciation of the Merchant Marine and the place it must hold in national prosperity and world stability. Unfortunately the public consciousness of war-built fleets has deterred the efforts of the industry to rebuild along right lines, but mass publicity during and since the war is swinging the pendulum back toward the realities, and it now seems that shipping and shipbuilding will have public opinion behind them.

The war-built surpluses are just that—*surpluses.* They are not part of the permanent economy and may prove a very valuable reserve. But their wartime cost should not be in any sense a deterring factor in the modernizing program. They were built for war, and should not interfere with ship construction any more than surplus bombs or bullets. Do the critics prefer that there should have been *no* surplus? Do they prefer that we had used them up in battle? Would that *all* had been saved!

Following the passage of the Merchant Marine Act there was a sound but meager start on a long-term shipbuilding program. With the loss or retirement of most of the older ships, the industry is ready for resumed construction.

It now seems certain that there will be a continuing construction program, which reasoning men expected all the time. It could not have been otherwise, for the nation was not retiring from the seas.

It further seems certain that ships will be built continuously on the Pacific, Gulf and Atlantic Coasts.

The prospects for passenger and cargo traffic have never been better in history.

We get depressed if business drops off, but a live prospect brightens the day. The prospects for year-after-year shipbuilding and year-after-year freight and passenger traffic to all parts of the world should raise the spirits of the shipbuilding fraternity beyond any peacetime era of the past.


The Sea Skimmer. This is a typical C-3 and is one of the first of the type to be turned over to Matson for conversion. She has been renamed Hawaiian Merchant. Except for painting, changes in cargo handling equipment will be the most obvious difference.

MATSON'S C-3 CARGO VESSELS

Principal Characteristics of the Matson C-3 freighters.

Length, overall	492′ 6″
Breadth, Molded	69′ 6″
Draft, loaded	29′ 4″
Gross Tonnage	7,886
Deadweight Tonnage	11,793
Engine	Turbine
Shaft Horsepower	8,500
Speed, Knots	16.5 to 18
Cruising Range, miles	26,000
Crew	51
Dry Cargo Space	520,195
Refrigerator space	62,500
Liquid Cargo space	65,620
Total	648,315
Fuel Oil	12,559 bbls.

MATSON NAVIGATION COMPANY has been assigned sixteen C-3 cargo vessels by the Maritime Commission of which five are now delivered and specifications and designs have been prepared for their conversion to Matson requirements. Two of these five are to be converted at the Alameda plant of the General Engineering and Dry Dock Corporation.

They constitute in part a fleet of the finest freight ships afloat, each one specially selected and modernized to meet the requirements of its special task. The total cost, including materials and equipment furnished by Matson, will run well above $600,000 for each ship, although it is doubtful if a casual observer of the exterior of the ships would be able to tell the converted vessel from her unconverted sister, except through the new paint job.

Each C-3 carries more cargo than five freight trains. The total capacity of the Matson C-3 is that of 216 railroad box cars plus 32 refrigerator cars plus 101 tank cars, equivalent to about five freight trains or, if you desire, a freight train 2-8 10 miles long. If a train of this size were made up on Market Street in San Francisco it would extend from the Ferry Building to Fifteenth Street.

They have new cargo loading and unloading facilities enabling them to load and discharge quickly and efficiently.

They have large, spacious quarters for officers and crew and are to be equipped with all the latest aids to navigation including radar and ship-to-shore telephones.

Eight of these new ships will operate on a new five and a half day schedule between California ports and Hawaii. Two have been assigned to the Pacific Northwest-Hawaii route and five will operate between Gulf and East Coast ports and Hawaii. The sixteenth ship has not been assigned.

The five and a half day schedule between California ports and Hawaii represents a thirty per cent improvement over the prewar seven to eleven days with proportionate reductions in running time on the Pacific Northwest and Gulf and East Coast routes.

The first vessel going into the General Engineering yard will be the Sea Skimmer, whose name is to be changed to Hawaiian Merchant. She is of the C3-S-A2 type as built by the Ingalls Shipbuilding Corporation.

Hull Strengthening

As built these vessels were allowed a molded draft of 28′-6″. Desiring a greater deadweight-carrying capacity the technical staff of Matson specified longitudinal strengthening by fitting a doubling plate along the upper edge of the sheer strake port and starboard, extending from frame 43 to frame 153. In way of new side ports at three positions within this range port and starboard the doubling plate is to be increased in thickness to compensate for these openings. Butts of the doubler are to be full V welded and edges to have 5/16 inch continuous welds. This strengthening is expected to obtain allowance of 29′-4″ maximum draft.

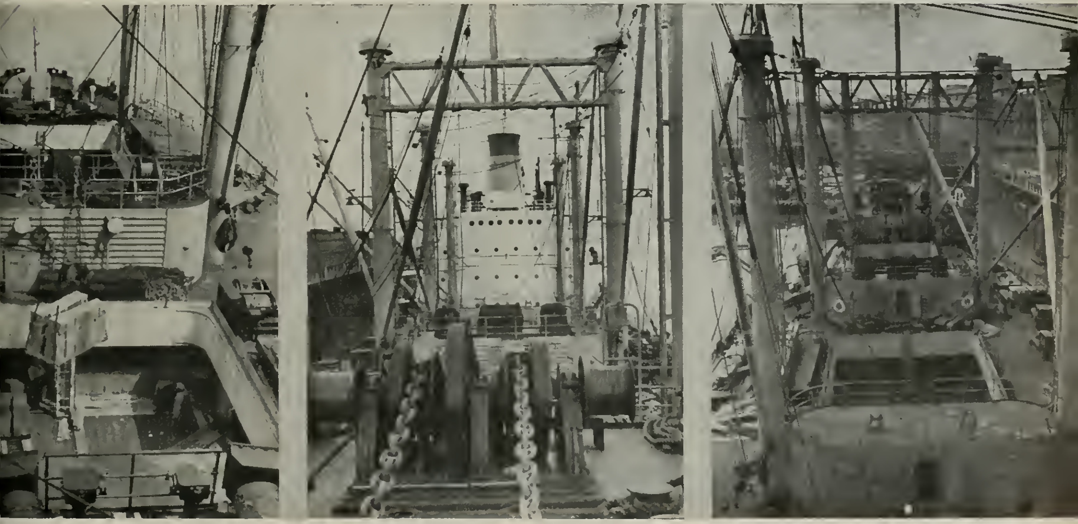
Cargo Deep Tanks

The two forward deep tanks in No. 5 hold are to be converted from dry cargo for the carriage of fuel oil only. New four inch suction and filling lines are to be installed; a steam smothering system is to be substituted for the existing CO_2 flooding and smoke detecting systems; and a pneumercator system installed.

The four existing deep tanks in Hold No. 2 are to be converted for carriage of molasses or fuel oil and a new pump is to be provided in a watertight enclosure amidships at the forward end of No. 3 hold. The existing drainage sumps are to be blanked off with bolted steel plates and new sumps 12 inches deep provided. A portable strainer in each sump will guard the suction of one of the new molasses pumps. An expansion trunk 30″ x 30″ is to be fitted to the top of each tank and is to terminate on the shelter deck.

For fire protection the steam smothering system is to be retained but the CO_2 flooding system is to be removed. The present heating coils are to be retained and the steam pressure reduced to 10 psi instead of the 50 psi now used. A pneumercator tank level system will be installed in each tank with indicators in the engine room.

Two vertical screw pumps are to be installed in the pump room, each driven by a 50 bhp, d. c. 230 volt motor. These pumps are for pumping either molasses or



On the left and on the right: Good views of the decks showing hatches and tween-deck stowage.
Center: On the Hawaiian Planter, ex-Sea Pegasus, appears the Naco cast steel 2¼″ stud link anchor chain.

▲
At top: Welin gravity type davits for motorboat and Welin boom-type davit for oar propelled boats on the Sea Skimmer.

▲
Lower: Radiomarine ship-to-shore telephone equipment on the C-3.

fuel oil. A Butterworth tank cleaning system will be installed whereby every inch of the inner surface of the tanks in No. 2 hold can be sprayed with salt water at 190 psi and 200° F.

Cargo Refrigeration

A total of 60,000 cubic feet net bale capacity of refrigerated cargo space is to be provided in the upper and lower 'tween decks of holds Nos. 3 and 4, with refrigerating machinery space located just forward of the engine room casing in Hold No. 3. This space is to be arranged in 20 huge refrigerators for perishable cargo. These refrigerators have been made in various sizes ranging from 1865 cubic feet to 4890 cubic feet. Their total capacity is equal to that of about 10,000 ordinary household refrigerators. They can maintain temperatures ranging from ten degrees below zero to fifty-five degrees above zero, a range of sixty-five degrees.

The maximum low temperature of ten below was designed specifically for the frozen fresh pineapple trade, one of Hawaii's newer industries.

Matson's new C-3's can now carry delicious, ripe pineapple, frozen in Hawaii, to the mainland in prime condition, a service not possible before the war when temperatures below ten above were considered impractical.

With the different size refrigerators, cargoes, too, can be segregated according to temperature or destination or peculiar requirements. No longer, for example, need butter be carried in the same refrigerator with fish.

This equipment, together with fast new schedules, will give Hawaii greatly increased supplies of chilled meats, fish, fruits, vegetables, dairy products and other perishables and quick-frozen products imported from the mainland.

Each of the refrigerators is provided with an electronic device which records the temperature at eight to twelve minute intervals on a master record. This provides a visual record to show shippers that their products were carried at exactly the temperature specified.

The refrigerant used will be Freon-12 and the distribution of refrigeration will be by circulation of calcium chloride brine.

The machinery will be Carrier and will comprise: 5 compressors complete with motors and controls; 5 condensers; 5 receivers; 5 evaporators-brine coolers; 1 vacuum pump; 16 cold air diffusers complete; 4 sets of room coils; 3 condenser circulating water pumps; 5 brine pumps; and brine heater.

All spaces are to be constructed to efficiently maintain temperatures between minus 10° F. and 100° F. ambient. Insulation is to be of rock wool except the decks which are insulated above with cork, below with mineral wool. A total of 10 inches of insulation is to be applied. Over the insulation one course of ¾″ x 4″ Oregon Pine tongue and groove, then two layers of waterproof paper, then another t & g course, then a mastic covering faced by ¾″ waterproof plyboard. Face of finished bulkhead will have 2″ x 2″ Oregon Pine cargo battens spaced 15″ centers and secured with brass screws.

Insulation of deck in lower twin decks spaces will be 8″ of corkboard. Then over the corkboard filler will be laid a layer of concrete 1½ inches thick and reinforced with poultry wire. Over the concrete there will be laid a flashing of 6 lb. lead which shall flash 12″ high against the first course of tongue and groove. The top edge of the lead flashing will be sealed with white lead and tacked. The lead flashing and the concrete will be covered with 1″ mastic reinforced with poultry wire and carried up the bulkheads for a height of six inches.

These refrigeration rooms and machinery must meet the requirements of the trade and are figured on the following data:

Outside Air	100° F.
Engine Room	100° F.
Sea Temperature	88° F.
Internal Ship Temp.	85° F.
Condensing Temp.	105° F. Max.
Pull down Period	72 hours
Stowage Factor	70 cu. ft. per short ton

With this data governing, the plant must meet either of these conditions:

(A) 48,000 cubic feet of fruits and vegetables received at 85° F. and carried at minus 10° F.

12,000 cubic feet of frozen foods received at 25° F. and carried at minus 10° F.

(B) 30,000 cubic feet of frozen foods received at zero F. and carried at minus 10° F.

30,000 cubic feet not under refrigeration.

A severe test must be passed by the plant as follows:

With all doors closed and all compartments empty, temperature in the chambers must be pulled down at a rate not exceeding 2° F. per hour to a temperature of minus 10° F., and held at this temperature for 24 hours without showing sweating. At the end of this period all machinery shall be closed down and the temperature rise shall not exceed an average of 2° F., per hour for subzero temperatures or an average of 1½° F. per hour for temperatures above zero degrees F. This test to be based on an ambient temperature of 85° F. and a dew point of 80° F.

Ventilation for the refrigeration machinery room will be assured by a 2000 cfm supply and a 5000 cfm exhaust capacity in fans and ducts. One of the principal reasons for this refrigeration capacity and for the minus 10° F. condition is the growing popularity of fresh frozen ripe pineapple.

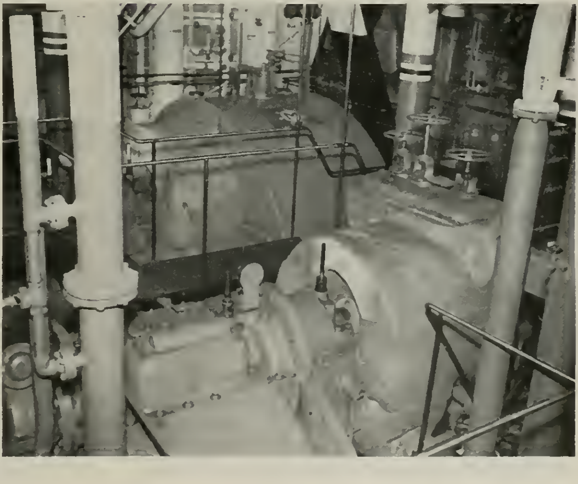
Bulk Sugar Transport

The necessity for shipping raw sugar in bags will be eliminated in the new C-3s with their raw sugar holds, having a total capacity of 7000 short tons. New conveyor and scraper systems will be used to unload the bulk raw sugar, so much so that they are converting their cargo spaces in all of these vessels so as to handle all sugar this way. The system of bulk sugar handling was described in the August, 1946 issue of the Pacific Marine Review. Special bulk loading facilities are being developed at the Hawaiian end which, together with the unloading equipment at Crockett, will put sugar handling on much the same basis as oil transport.

In line with this movement the sugar holds of the C-3's under discussion will be especially equipped to take care of the scrapers that feed the unloading conveyor and a well or wells will be installed in each hold which will form a suction sump for the lower wheel of the vertical conveyor arm.

All deck beams and other structural details that would cause sugar to lodge are to be boxed in with steel plate

(Please turn to page 120a)



The turbine room on the C-3. ►

R. Stanley Dollar (left) president of the Dollar Steamship Line The Robert Dollar Co and Globe Wireless Ltd and his son, R Stanley Dollar, Jr., vice president of these companies at a press conference in Mr Dollar's office in the Robert Dollar Building, San Francisco, where Mr Dollar discussed the recent unanimous decision of the Supreme Court stating that R. Stanley Dollar Dollar Steamship Line, the J Harold Dollar Estates Company, et al will have a chance to prove in court their contention that they own the company stock now in the hands of the U. S. Maritime Commission

DOLLAR'S SUPREME COURT VICTORY

CAPTAIN ROBERT DOLLAR embarked upon his steamship career in 1893 with the purchase of the steam schooner Newsboy, a tiny vessel of 200 tons, which he used to transport his lumber from the Pacific Northwest to markets along the Coast.

Gradually enlarging his shipping operations, in 1910 Captain Robert Dollar organized the Dollar Steamship Line, and on January 5, 1924 inaugurated the famous Dollar Line system of Round-the-World passenger and cargo liners circling the globe at regularly spaced intervals corresponding in point of time to two weeks between ships.

The Dollar Line initiated and pioneered many innovations previously unheard of in shipping circles, such as: Publishing scheduled departure and arrival hours of ships and scrupulously observing these schedules; and that of placing Americans in charge of their offices in all foreign ports the Dollar ships touched.

From the beginning of their steamship ventures and throughout the entire period of operations until 1928, the Dollar Lines operated successfully and profitably without government subsidy or aid, despite the handicaps forced on American flag operators. The Company received the commendation of American business institutions interested in the development of foreign trade and were rated the largest single factor in the development of the modern American Merchant Marine.

In 1928 the Dollar Steamship Line entered into contracts with the United States for the carriage of mails under the terms of the Merchant Marine Act of 1928, and in reliance on those contracts, constructed two Transpacific liners (SS President Hoover and SS President

Coolidge), borrowing a portion of the funds for that purpose through the United States Maritime Commission.

The Dollar Steamship Line performed its mail contracts with the United States until they were cancelled on June 30, 1937, by the Merchant Marine Act of 1936. That Act provided for a fair settlement of claims of mail contractors arising out of premature concellation of their contracts and authorized the Maritime Commission to grant in lieu of mail contracts operating differential subsidies.

Stating that "the Supreme Court decision will give the rightful owners of the Dollar Line stock (now American President Lines) an opportunity to present their case in court." R. Stanley Dollar gave a representative press group a detailed account of the events that led up to the transfer of the stock control to the Maritime Commision in 1938, and issued the following explanation:

The Maritime Commission refused to make any settlement of the claims for contract cancellation presented by the Dollar Steamship Line and refused to grant any operating subsidy to it for more than six months. During that time the line was forced to maintain its services without allowances of any kind by the government, doing so at a weekly loss of between $60,000 and $70,000.

From 1934 on, a series of steps were taken by the Maritime Commission, the inevitable effect of which forced a crisis in the company's financial conditions:

1. For five years before 1938, the Maritime Commission subjected the Line to constant harrassment which interfered with management and operations in any normal manner. During that period of time the company's executives were required to spend much of their time in Washington submitting to investigations, questionnaires and discussions with government boards and agencies.

2. The Post Office Department, upon various pretexts, held up payments due the company under mail contracts, while at the same time the Maritime Commission compelled the Dollar Company to meet monthly payments on indebtedness to the government.

3. A world-wide financial depression resulted in a sharp decline in business and a loss in freight and passenger revenues.

4. The company sustained heavy losses in revenue because of two Pacific Coast maritime strikes in 1934 and 1936.

5. When the Dollar Company's mail contracts were prematurely concelled on June 30. 1937, the government not only refused to replace them with the substituting subsidy provided by Congress, but also withheld payments admittedly due from the government. This compelled the company to sustain heavy financial losses while it maintained service for which the Dollar Company was never compensated and from which condition no relief was given until the following year.

6. While the company was carrying on service without the benefit of mail pay or subsidy, it lost the Transpacific liner President Hoover when it stranded off Formosa.

7. When the Maritime Commission finally granted an operating subsidy to the Dollar Company on January 25, 1938, it was only a temporary one for six months, and even that temporary subsidy was only on onerous conditions, including the following:

(a) A surrender and cancellation without consideration by the company of some $6,000,000 in claims against the government for default under its mail contracts and a dismissal of suits in the Court of Claims, a portion of which were admitted by the Commission to be justly due the company.

(b) An addition of $500,000 in cash for company capital.

(c) A surrender by trade creditors and others of indebtedness to them by the Dollar Company in exchange for shares of stock of the company either in whole or in part.

(d) An agreement which would permit the Commission to accelerate the maturity of all debts owed the United States if the subsidy was not later extended or renewed by the Commission.

The Dollar Company was compelled to accept these conditions or face the alternative of continuing to operate at ruinous losses and be faced with insolvency. When these conditions were accepted the company was assured that a permanent subsidy would be given upon a completion of the agreed terms.

8. But when the temporary subsidy expired on July 25, 1938, the Commission refused to renew it and the Dollar Company was again faced with carrying on its foreign trade operations at enormous loss.

9. Finally, on August 15, 1938, R Stanley Dollar and his associates were faced with an ultimatum from the Commission that they sign a contract transferring to the Commission their stock in the company or be faced with bankruptcy and discontinuance of the Line's operations.

The alternative to transferring the shares of stock meant not only the bankruptcy of the Dollar Company and an end to its operations, but also ruinous losses to others. This left the stockholders no real choice, for:

1. There were hundreds of officers and employees of the company with their families scattered the world over in various ports, all of whom would have been left in foreign lands without resources if service had been discontinued. Dollar stockholders and Mr. Dollar felt personally responsible for these employees and their families.

2. A million dollars in passenger tickets of the line were outstanding and many of the passengers were already in various parts of the world where they would have been stranded if service had ceased and the tickets were not honored.

3. Thousands of tons of cargo had been booked and shippers were depending on the line to make deliveries.

R. Stanley Dollar, having for more than a year made every effort to reach some reasonable agreement with the Commission, realized that all such attempts were futile and adopted the only course really open when he, and his associates as stockholders, signed the agreement demanded by the Commission on August 15, 1938.

With the signing of the agreement, stock representing 92% control of the Dollar Steamship Lines was transferred to the Commission. In approximately five years thereafter, all of the indebtedness to the government was

(Please turn to page 120-C)

Under the instruction of Ensign John Bundock, USMS, a student of the Boatswain's School completes a Jacob's Ladder in Marlinspike class. Students learn by actual doing.

Working with miniature cargo gear, Ensign William Kerr, USMS, explains the different tackles and methods of rigging cargo gear to Fundamentals of Seamanship students at the U. S. Maritime Service Training Station, Alameda. Later, the men will work with full-size cargo gear installed on the station.

Fundamentals of Seamanship students follow the instructions of Ensign Bundock in making a boat fender. A finished product can be seen on the right.

POSTWAR PERSONNEL TRAINING CONTINUES

THE OPPORTUNITY FOR ALL UNLICENSED seamen to receive training in the Deck, Engine, or Steward's Department, which enabled thousands of men to advance themselves and the efficiency of their ships during the war, is being continued by the Training Division of the United States Maritime Service.

This training is available to all unlicensed seamen on the Pacific Coast at the United States Maritime Service Training Station located at Alameda, California. In order to qualify, a seaman must have served a minimum of eight months out of the last twelve months aboard vessels of the U. S. Merchant Marine. Eligible applicants are enrolled weekly in all courses with the exception of Pre-License Deck, Pre-License Engine and Chief Stewards, who enroll once a month, and Electricians, who enroll once every two months.

Students accepted for training are provided free quarters, meals, textbooks and clothing and receive from $90 to $115 per month pay according to the Seaman's Certificate held and the course of training taken. The length of training of all courses, with the exception of Electricity, is for a period of 30 days. For Electricity it is 60 days.

The training now available will equip every student in his chosen profession with the most modern, progressive and efficient methods. Enrollments for this training are now being accepted at the United States Maritime Service Enrolling Office, 1000 Geary Street, San Francisco, California.

Objectives of this training are according to the courses pursued, namely:

Deck Department

1. Seamanship: To provide all unlicensed deck department personnel with the basic trade knowledge of all such personnel to become better qualified seamen, to promote safe and economical practices on deck, and to assist students to qualify for certificates as *Able Bodied Seaman.*

2. Boatswain's Training: To familiarize qualified seamen with the duties, responsibilities and qualities of leadership required of competent and qualified Boatswains aboard the typical merchant ship.

3. Pre-License Deck: To provide experienced seamen, possessing the necessary qualifications, with the technical knowledge needed to successfully pass the U. S. Coast Guard examinations for deck officers.

Engine Department

1. Marine Engineering: To provide all unlicensed engine room personnel with fundamental theory and basic knowledge of main propelling machinery, auxiliaries and electricity which is necessary to enable students to become more proficient in their present capacity aboard

ship and to further prepare subject students for continued study and advancement.

2. Machine Shop and Mechanical Drawing: To provide engine room personnel with the fundamental knowledge and manipulative skills of machine shop practice and mechanical drawing which will enable them to make working drawings, understand manufacturers' blueprints and further enable them to perform the operations necessary to make replacement parts for ship's machinery.

3. Electricity: To provide engine room personnel with the fundamental theory of electricity as applied to marine electricity and with the manipulative skills necessary for the efficient operation and maintenance of all types of ship's electrical equipment.

4. Pre-License Engine: To provide unlicensed engine room personnel who have sufficient seatime for an engineer's license with the fundamental theory and practical knowledge necessary to prepare for original license examination and to further prepare them in the practical knowledge necessary to perform properly the duties of a third assistant engineer aboard a steam powered ocean-going vessel of any tonnage.

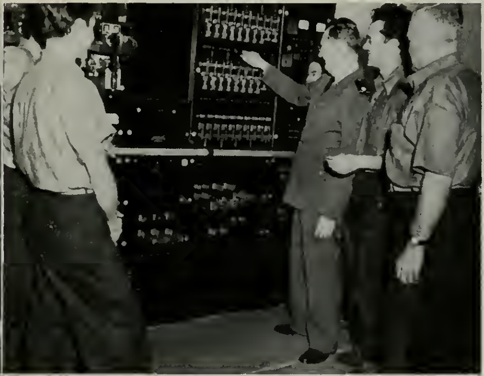
Steward's Department

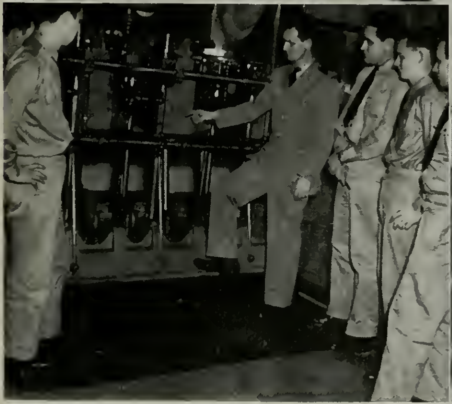
1. Bakers, Butchers and Cooks: To provide the shipping industry with basically well-trained bakers, butchers and cooks who will continue to progress through sea experience and advanced vocational training.

2. Chief Stewards: To provide the shipping industry with basically well-trained Chief Stewards who will become familiar with the latest forms of food record keeping, proper handling and stowage of food, sanitation and cleanliness in the galley and advanced vocational training

▼ In preparation for examination as Third Assistant Engineers, Pre-License Engine School students take notes while Lieut. L. F. Butzer, USMS, lectures on engineering theory.

▼ Electrician Walter Bond, USMS, demonstrates switchboard operation to Electrician's School.





▲ Lieut. Butzer instructs Pre-License Engine School students on the parts of a reciprocating engine.

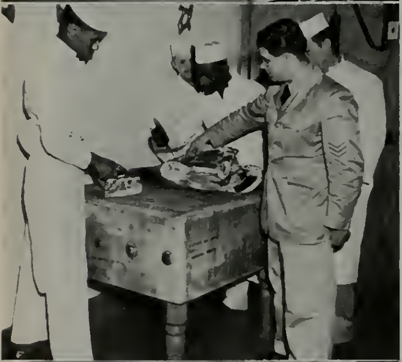
▲ On the flying bridge of the Seamanship Building Deck Pre-License students practice taking sights with plastic lifeboat sextants under the supervision of Lieut. Charles Handley. Later in the course, students will use real sextants.

Students in the Chief Steward School at the Maritime Service Training Station, Alameda, in bookkeeping and food record class. Lieut. Walter Tanghe, USMS, and Ensign Irving Michaelson, USMS, are the instructors.

◄

Baking school students at the U. S. Maritime Service Training Station, Alameda, at work in the training galley.

◄



Ck. l/c Clifford Kimball instructs students in the butchering school in the proper technique of removing the bone from a leg of beef.

◄

A student in the baking school removes pie shells from an oven in bake shop of the training galley.

▼

CREW-TRAINING FOR SPECIFIC SHIPS IS A GREAT DEVELOPMENT

TO PROVIDE EFFICIENTLY TRAINED Steward's Department personnel aboard vessels of the American Merchant Marine, the U. S. Maritime Commission in cooperation with operators of passenger vessels and the seamen's organizations with which they have contracts have agreed upon a standardized stewards' training program.

Government, management and labor, realizing the effectiveness of the initial stewards' training offered at Sheepshead Bay, in conjunction with the re-entry of the S. S. America in the North Atlantic passenger service, are cooperating for expansion of the program to provide trained personnel for additional vessels as they enter the service. To make possible the continuation of this training, management has agreed to pay the basic wages of the personnel assigned to the specific passenger vessels while they are taking the course at the U. S. Maritime Service Training Station.

The first of the ships to be put into service under this program are the President Cleveland of American President Lines, and the Argentina and Brazil of the Moore-McCormack Lines, Inc., which are expected to be in operation this summer. The training program conducted by the training division got under way April 15 and is to be followed by additional courses as new passenger ships enter the service.

The Steward's Department of the President Cleveland will be trained at the U. S. Maritime Service Training Station in Alameda, prior to the delivery of the Cleveland, where a mock-up stateroom will be in readiness and the chief steward of the Cleveland in attendance. Included in the training program are all those who directly serve the public, such as waiters, room stewards, public room attendants and bell-boys, and also the cooks, bakers, and others in the Steward's Department.

By agreement between the Pacific American Shipowners Association and the Marine Cooks and Stewards Union, these prospective crew members will be screened by the Union and then screened by the company. The entire program marks a great and vital advance in employer-employee relations.

Cooking school students prepare vegetable soup in the training galley.

View of the interior of the cooks and bakers galley showing equipment in place and remodeling completed.

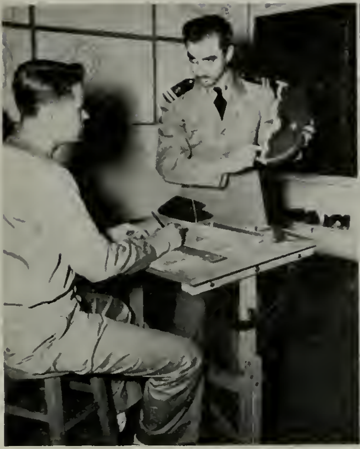
▼

A student in the Drawing School is shown a model used in detailed mechanical drawing by instructor Lieut. Irvin Colt, USMS. ►

Lieut. Charles Handley, USMS, helps a student with a plotting problem in a terrestrial navigation class, part of the Deck Pre-License course. ►

▼ Under the supervision of Lieut. Irvin Colt, USMS, students carry out practical lathe instruction as part of the machine shop course.

Lt. (jg) W. H. Thorkelson, USMS, Rules of the Road instructor, explains a sailing situation training board to Deck Pre-License students. ▼



▲ Students in the electrician's school test circuits on motor generators and other electrical apparatus under the guidance of Electrician Walter Bond, USMS.

▲ Students of the Deck Pre-License School watch intently as Lieut. Charles Handley, USMS, demonstrates the Gyro. The operation and maintenance of the Gyro, as well as a knowledge of other navigation instruments are included in the Deck Pre-License course.

The aerial photograph above shows the SS President Cleveland (left) and the SS President Wilson, 23,000-ton luxury liners being outfitted at Bethlehem-Alameda Shipyard, Inc., in Alameda. Delays, occasioned by a severe shortage of skilled workmen, particularly joiners, sheet metal workers, electricians and pipefitters, plus last year's strike in the electrical industry, have set delivery date of the Cleveland back to some time in August.

CAULKERS AND GROMMETS

VISITS TO A SHIP UNDER CONSTRUCTION always develop some points of human interest and our recent inspection of the S. S. President Cleveland now nearing completion in the Alameda yard of the Shipbuilding Division of Bethlehem Steel Company was no exception to this rule.

President Cleveland and her sister, President Wilson, are the two largest passenger vessels built on the Pacific Coast. They are under a contract granted Bethlehem by the U. S. Maritime Commission and when completed, will be taken over by the American President Lines for their service from San Francisco to the Orient. Equipped with all the most modern devices, controls, and equipment for safety, comfort, cuisine, and good times, these vessels will have a sea service speed of 20½ knots and will be able in a pinch to make 22 knots.

To such a steamer building on the Pacific Coast come materials, equipment and machinery from all parts of the United States and from many foreign countries. Instances of this widespread material source are: rubber from the East Indies; hardwood from Africa; rope fiber from the Philippines; lacquer oils from China; tin from the Straits Settlements; iron from South America; and fabrics from Europe. We picked out machinery contributions from some 16 of the United States and there must be as many more that have contributed material directly or indirectly.

As we emerged from a visit to the machinery spaces and came out on to the boat deck we were confronted with a good example of one of the most ancient manual crafts in the old art of wooden shipbuilding—a caulker paying a caulked seam with caulking compound.

Undoubtedly caulkers worked on the Ark which, according to the specifications, was "pitched within and without with pitch." We know they must have worked on the hulls built in Ancient Egypt and around the eastern end of the Mediterranean. The caulkers trade is the art of driving oakum or cottton into the seams of a ship's wooden deck or sides so as to make a tight joint and then paying or filling the seam above the oakum with hot pitch or caulking compound. To do this he has a collection of tools in various chisel shapes known as caulking irons, a short handled long headed mallet; a small heater

(Please turn to page 120-B)

The Caulker's Art

◄
Above, left: With caulking iron.

▲
Above and below, right: Driving in the cotton and oakum.

◄
Below. left: Filling the seams with pitch.

JAPANESE MERCHANT FLEET WARTIME AND POSTWAR CONTROL

By H. L. HAEHL, JR.

Commander
H. L. Haehl, Jr.

SHORTLY AFTER THE OCCUPATION of Japan commenced, I received quite unexpected orders to proceed from Guam, where I was then stationed, to Japan to report to something called SCAJAP. A quick check showed that this was the abbreviation for the long-winded title of Shipping Control Administrator Japanese Merchant Marine, a Task Group of the Fifth Fleet, and that it was commanded by Rear Admiral D. B. Beary, now the Commandant of the Twelfth Naval District.

We found that Japanese shipping affairs were in a terrible mess, and it was this discovery, plus a curiosity as to how they got into such a state, which led to collecting the material on which this discussion is based.

What the Japanese insisted on calling the "China Incident" occurred in July, 1937, and it served as the starting point of a gradual program of increasing government control of the Japanese shipping industry, a process which continued until the end of World War II. The program did not develop uniformly, and was at all times strongly opposed by private industry. The leaders of the resistance were part of the now largely dissolved Zaibatsu—the then all-powerful ruling families of Japan. They were no mean antagonists, even for the government. Gradually, gaining impetus from each change in the international scene, the controls spread to more and more phases of industry and reached deeper and deeper into the smallest incidents of daily operation. Finally, in the last desperate years of the war—and in the shipping field, desperation came early to Japan— the last vestiges of private operation disappeared and the government assumed complete control for what developed to be the dissolution and destruction of a once great merchant marine.

Before the China Incident, in keeping with a definite policy of encouraging shipping as an instrument of foreign policy, the only government restrictions were those in the Shipping Trade Control Act of 1936, which granted subsidies and conditioned these grants with certain regulations against unfair competition. A great boom in the shipping market was developing, and it was apparent that rate regulation was needed to keep vessels in essential trades. For the ostensible purpose of enabling the industry to best serve the national needs, the seven leading companies, controlling about 75 per cent of the national tonnage, formed the Voluntary Shipping Federation. These companies were N.Y.K., O.S.K., Kawasaki, Yamashita, Mitsui, Kokusai, and Daito. One of the principal, but unexpressed, reasons for creating the Federation was to forestall government action in this direction. The Federation operated as a trust, a self-imposed price control system as to freight and charter rates for certain basic commodities and services.

After the Japanese Army engineered the China Incident, the days of unrestricted trade, subject only to sufficient voluntary controls to prevent government interference, were ended. Ships were scarce; the military began requisitioning vessels and the supply requirements of the armies in China aggravated the ship shortage, unbalanced trade routes and made freight and charter rates soar. Dropping its laissez faire policy, the government passed the Temporary Shipping Control Act, authorizing the regulation of freight and charter rates. Faced with this, the seven-company Federation developed a sudden democratic fellow feeling for the smaller ship owners. It was more important to present a solid industry front against government encroachment than to maintain the dictatorial powers formerly exercised by the big companies over the small ones. So the Voluntary Shipping Control Committee was set up by the industry to apply voluntary rate controls over a wider range. But as scarcities increased, the temptation to avoid fixed-rate cargoes and services lead an increasing number of operators to

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* The author is now on inactive duty in the United States Naval Reserve. He has pointed out that any opinions expressed are his own private ones and are not to be construed as official or as reflecting the views of the Navy Department or the Naval Service at large.

The "Silent Service" Speaks on 47th Anniversary of First Submarine

It was in a place on Market Street and the Sailor was minding his own business, drinking his beer.

A civilian accosted him and wanted a description of all the gadgets, ribbons and what not he wore on his blouse.

Tersely, but obviously without pleasure, the bluejacket described his decorations.

"What's that little silver pin"? the civilian asked.

"Submarine Combat," snapped the sailor.

"You don't like to talk, do you"? the civilian countered.

"They call us the 'Silent Service,'" the sailor answered.

"Well the war is over. You don't have to be so silent now, do you"?

"Certainly," was the sailors reply. "It's the tradition of the Submarine Service—we don't want everybody to know we won the war."

Whether the submarines won the war is of course, open to debate, except with submariners.

The Navy's celebration on April 11 of the 47th anniversary of acceptance by the Navy of its first submarine, was the first emphasis ever to be put publicity by the Navy on the Submarine Service.

Submarines contributed directly to the destruction of some two-thirds of the Japanese Merchant fleet and to the demise of about one-third of their vessels of war. The 2,387,780 tons of enemy shipping sunk is for ships over 1,000 tons however, and does not include the large numbers of smaller vessels which were also sent to the bottom.

Submarines were not merely an instrument of destruction during the war, but also mercy ships. They rescued 504 Allied aviators from enemy controlled waters. They supplied and reinforced guerrillas in the Philippines, and performed many valuable reconnaissance services.

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resort to any subterfuge to employ their ships in the more lucrative open markets and trades still remaining.

This was in 1939, before hostilities began in Europe. Shipping men were more interested in profits than in the China War, which they had neither particularly favored nor planned. That was an Army affair, and the Army was not yet so powerful but what the long-established Zaibatsu still clung to its power.

Meanwhile, the Shipping Association Act had been passed in April, 1939, but had never been put into effect. With the start of World War II in September, things happened rapidly. The Cabinet had just passed a set of instructions for administering shipping control which, for the first time, switched from rate regulation to restriction on the use and distribution of vessels. Under this, the Voluntary Shipping Control Committee was given official sanction and, with unusual frankness, dropped the word "Voluntary" from its name. A policy-making organization of both government and industry representatives was created and in December, 1939, the Shipping Association Act was put into effect by Imperial Ordinance.

This arrangement lasted until October, 1940, with the government still acting only in a policy-making capacity.

Asama Maru, passenger and cargo liner (now sunk), gross tons 16,975 net tons, 10,017. She was built in 1929 at Mitsubishi in Nagasaki for the Nippon Yusen K. K. Her length was 560, beam 72, and depth 42.5.

Controls were enforced by the industry itself. Although operators could be compelled to accept essential cargoes or to sign compulsory charters, private shipping contracts remained largely unaffected and the physical operation of vessels was not controlled.

As the nations of the world prepared for war, the scramble for materials and vessels aggravated the already serious vessel shortage. The list of priority cargoes kept getting longer and longer. In September, 1940, the Cabinet issued "Instructions Regarding National Merchant Marine Control Policy" designed to control the allocation of shipping on a broad basis and to do away with what the instructions described as "selfish commercialism of the individual shipping companies." The industry was directed to organize a corporation, the "Controlled Transportation Association," to accept cargo contracts on behalf of all operators as directed by the government and to be responsible for performance of the contracts. Henceforward, the sole mission of the industry was said to be the carriage of cargoes "vital to the national existence"—which is perhaps another way of saying "necessity for preparation for war." About this time, the "New Order" was blossoming and the plan was politically in vogue. The industry-formed corporation had all the characteristics of the Fascist State Corporation. Through it, the New Order would eliminate the weaknesses of private enterprise which the democracies tolerated, and perfect efficiency would come from a planned industry. But it didn't work out that way.

The operators were formed into twelve "blocs," each responsible to the Association, divided up as to size and type of vessels. But in forming the Association, the operators had slipped in a joker—a clause which permitted carriers to enter into special contracts with their customary shippers. By some strange coincidence, operators who had business or trade affiliations all turned up in the same bloc together, and soon developed a large volume of these "special contracts" which served not only to keep their former shipping relations alive, but also to make them unavailable for allocation of unprofitable cargoes. The same major companies which had long controlled the industry turned up as the bloc leaders. Cargoes were allocated among the blocs, but allocation within the bloc was done by the members and largely followed their desires and business interests. The ship owners had received a blow, but they had rolled with it and were still on their feet.

The Association soon degenerated into a sort of arbitrator and squabbling arose within the blocs because certain lines could not operate profitably at the prescribed rates. The latter was avoided by an arbitrary determination of charter values for all vessels and by allowing each operator this value, plus a profit, the excess earned being deposited in a fund from which those who lost money could be paid. But to the dismay of the New Order planners, the operators began reporting greatly increased costs. Unless one realized that such a thing was impossible under the efficiency of a totalitarian system, one would almost think that patriotic loyalty to the New Order was not as effective a means of inducing economy as the competitive profit motive had been.

Knowing that war was approaching, and seeing the amount of bickering already going on over trades and profits, the government realized that the system would fall to pieces when war started and dangerous voyages had to be allocated. So, after about a year of the bloc system, the second Konoye Cabinet, in August, 1941, beban to develop a scheme for more rigid control. Tojo supported the idea and in March, 1942, after the out-

Tonan Maru No. 2 (now sunk) was built as a whale oil factory in 1937 at the Osaka Iron Works for the Nippon Suisan K.K. Gross tons is 19,425 and net tonnage is 13,402. Her length is 534, beam 74 and depth 56.8.

Keifuku Maru is operating as a passenger and cargo vessel, gross tonnage is 5833, net tonnage 4241. She was built in 1919 at the Kawasaki shipyard, Kobe, for the Daiko Syosen K. K. Her length is 385, beam 51, depth 36 and her speed is 10 knots.

break of war in the Pacific, the Wartime Shipping Control Ordinance was promulgated, based upon the National Mobilization Act of 1938. This act was the basic control legislation throughout the war and, in fact, is still in force. Under it, a new organization had to be formed to replace the former Controlled Transportation Association. To the Japanese, failure cannot be condoned. If an organization fails, it cannot be reorganized. You must form a new one—one with a new face. The new organization was the Shipping Control Association, destined to last out the rest of the war. It was the organization—greatly expanded and changed in the interval—which we discovered in operation when the occupation commenced. It was to carry out the government's wishes and to have the power to enforce compliance, regardless of any desire for self-government within the industry. It was the sole charterer of all vessels over 100 tons requisitioned by the government. It was formed by the ship owners, but was to be government-supported and to have semi-governmental status. Steamship operators were to be selected by the Ministry of Transportation to operate the requisition-chartered ships as agents of SCA. SCA made all contracts with shippers and passengers, paid expenses, and collected revenues. Conscription of seamen was authorized, but not carried out at this time.

Almost immediately, difficulties arose in the selection of operators. The industry had expected that only established lines would be selected, but the Ministry of Transportation, for political reasons, appointed a great many companies, the excellence of whose political connections was equalled only by their lack of experience or ability as ship operators. Sixty operating agents were designated, many of them almost incompetent, but all more than willing to undertake an operation where management fees were assured and the government paid all losses.

When it became apparent that the government would continue to increase its control, the industry followed the familiar principle: "If you can't lick 'em, join 'em!" As a result, the big shipping companies, particularly N. Y. K., filtered their men into all of the top positions of SCA. In effect, the industry took over SCA, and, having done so, the first move was for the closely knit faction of big companies to regain control. To do this, SCA suggested that the too-numerous operators be consolidated into five large groups, or "han". The announced reason was to increase efficiency, and to gain the benefit of the knowledge and experience of those operators who had demonstrated the greatest ability. This was done in February, 1943. Each group or "han" leader became responsible for the way all ships allocated to the group were operated; each group maintained a joint office for its members in Tokyo, and in the principal ports, where liaison matters with SCA and arrangements for all centrally procured supplies or materials were handled. At first glance, it would seem that events had come full-cycle back to the former "bloc" system of 1940. They were similiar in the advantage they gave the big companies, but under the former system, the desires of individual members were considered in the allocations within the bloc, whereas, now the leader had nothing to do with vessel allocations and really acted as little more than conduit for government orders and a whipping boy for the government if any of the group operators performed badly. This was about the last real effort of the operators to resist domination. Because it was SCA's idea, it was never popular with the Ministry of Transportation, and many felt it never was given a fair trial.

After only a few months, the group system was abandoned and the Cabinet issued new instructions reducing the ship managing operators from 60 to 22. Discarded operators were either alloted to or required to combine or merge with one of the remaining operators. The consolidations were completed in October, 1943, and affected not only vessels but also all shoreside and floating facilities and all operating personnel.

SCA had remained a rather anomalous organization—one actually composed of steamship men and formed by the industry, yet directed by the government and having semi-governmental powers and responsibilities to the Ministry of Transportation. It was, in a way, neither fish nor fowl. Hence, when a far-reaching reorganization of the administrative departments of the government was made in February, 1944, it was natural that SCA and the general administration of maritime affairs were affected. The president of SCA became a Commissioner of the Marine Bureau, a division of the Ministry of Transportation, and other smaller changes were made, all designed to bring SCA more into the government orbit, and to obtain greater efficiency by some consolidation of the planning functions of the Marine Bureau and the operating functions of SCA. SCA had been growing tremendously as the reduced activities of the companies rendered more and more of their personnel non-essential. To provide them with comfortable berths and assured incomes, they were transferred in droves to the government payroll of SCA where they performed no functions other than to draw their paychecks.

By now the operators had lost control of the employment of their ships and of the cargoes, but they still employed the seamen and maintained a part of their organizations intact.

But in July, 1944, a Cabinet resolution exercised the power to conscript seamen. They were all given government service ratings and became the direct employees of SCA. The operators thereafter neither hired, paid, nor fired. This involved a further expansion of SCA personnel in the creation of a Seamen's Division to arrange the manning of all vessels, the handling of all seamen's accounts and to make recommendations for changes of rating and promotions.

By early 1945, the war was going very badly for Japan. Merchant vessels were being destroyed rapidly, and the air attacks were striking at shipyards, port facilities, and supply dumps. The great ports were being wrecked and the approaches to them mined. As the need for repairs increased, shipyard facilities decreased. The supply of port labor for repairs, loading, and discharging dwindled both from casualties and because of a general exodus of civilians from the bombed ports. Competition for priorities for repairs, bunkering, and port services became acute, not only between private operating agents, but also between merchant ships as a class and the Army and Navy vessels. Military vessels had priority, and private agents in increasing numbers turned to SCA to bring government pressure to bear in obtaining necessary services. SCA assistance was needed with such growing frequency, both as the spokesman for merchant shipping and as an arbitrator between private agents, that the operating agent system was growing meaningless, for the agents were almost helpless without assistance from SCA. This was particularly true as to repairs and surveys, and it was in this field that SCA first abandoned the operating agent system and took over operations itself. Allocations to yards, relative priorities, and all financial or other dealings with the shipyards were assumed by SCA.

The value of the operating agent system, in large part, consisted of maintaining initiative and some degree of competition between the agents, but, with SCA controlling seamen and repairs, and with all other activities so hampered and services so scarce, it became impossible to define the boundary between SCA's responsibility and that of the operating agents. The system having become useless, in February, 1945, the Cabinet directed SCA to take over all operating functions entirely. SCA became a single giant steamship company to operate all merchant vessels with its own personnel, under unified control. The shipping companies ceased to exist except as the owners of requisitioned vessels.

Shipping affairs began to collapse. There were forced deviations to avoid mines, submarines, or air attack, port delays, excessive repairs of war damage, and losses of seagoing personnel. SCA's financial deficit grew to fantastic figures. To make matters worse, seamen, stevedores, and port workers, terrified by the heavy air-raids on all major ports and port areas, could not be induced to work except by paying ever-increasing bonuses. Their homes were destroyed, their families scattered, and the safety of the inland hills looked awfully good to them. The shortage of shipyard and dock workers would have been much more acute except for the fact the raids also destroyed so many yards and dock areas and so many ports were closed by mines.

SCA began to suffer increasingly in competition with the Army and Navy. Throughout the war, the Army, Navy, and SCA had operated entirely independently of one another, with no coordination, joint planning or cooperation among them, and with entirely separate and often actively hostile and competing operating staffs. As the holder of the lowest priority of the three, SCA felt the growing shortages most accutely.

At long last, in desperation, the government realized that no one type of effort—military or merchant—could be preferred over another. Workmen, food, and essential materials carried by SCA vessels were as vital as the military personnel and ammunition carried by the Army and Navy vessels. As the war came nearer the home islands, everyone was in the front line. At this too-late stage, wasteful duplication of shore establishments, inter-service rivalries and lack of discipline among workers

(Please turn to page 146)

The Cunard White Star liner Parthia, whose launching took place on February 25th at the Belfast yard of Harland & Wolff.

RESTORING BRITAIN'S MERCHANT FLEET

THE GAP BETWEEN THE PREWAR and present tonnage of Britain's merchant fleet is being closed.

The merchant fleet in British ownership at the beginning of the war was 17,400,000 tons. At present it is 13,900,000 tons, and Sir Ernest Murrant, president of the Chamber of Shipping of the United Kingdom has recently given details showing how the industry is bridging this gap of 3.5 million tons. £150,000,000 ($600,000,000) is to be spent on tonnage under construction or on order in United Kingdom shipyards, £60,000,000 ($240,000,000) worth of tonnage will be bought by British private owners from the Government and about £20,000,000 ($80,000,000) will be spent on the purchase of United States warbuilt vessels. These additions, in all, would total 3,500,000 tons.

The recent Government Economic White Paper emphasized the urgent need of restoring the British merchant fleet to prewar dimensions, since the shipbuilding industry is just as important an earner of foreign exchange as an industry producing entirely for export. Last year British shipyards produced nearly 1,000,000 tons of shipping. For 1947, the Government has set them a target of 1,250,000 tons, plus a large repair program.

Three Million Tons of Shipping Repaired Monthly

In launching on its 1947 program the United Kingdom ship repairing industry has maintained the gigantic drive begun early in the war. During March the facts of this wartime achievement were released. The difficulties entailed in carrying out vast war repairs under threat of constant air attacks were enhanced,—first, by the decrease during the two wars in the number of dry docks available for merchant ship repair, and second, by the shortage of skilled labor. The 1939-45 war showed something like a reduction of one-third the number of men employed, compared with the 1914-18 war. Despite these handicaps the U. K. ship repairing industry recorded an average monthly output of over 3,000,000 tons, compared with less than 2,000,000 per month in the first World War.

An interesting feature of British ship repair work during the last war was the system of "Allied" yards—Dutch, Polish, Belgian, etc.—where firms carried out work largely on vessels under their respective flags.

One of the biggest problems facing the industry was the enormous program of conversion work on merchant ships to augment the Royal Navy. Passenger liners, for example, were converted to armed merchant cruisers; cargo liners to minelaying; trawlers to minesweepers. The industry's task today is more conventional, but in view of the importance of increasing ship's tonnage in the British postwar economy, it remains a vitally urgent one.

New Ships

While the British ship repair yards are working full

The Helicina, flagship of the Anglo-Saxon Petroleum Co. tanker fleet.

Photo supplied by the British Information Services.

pressure, other yards are equally busy on new tonnage. Shipyards on the River Wear, for example, report a program which will take nearly three years to complete. During the week of February 24-March 1, sixteen new contracts were reported by Lloyds List as placed with U. K. yards, of which eight are for overseas (four for Bergen, Norway). The biggest contracts are for three cargo passenger steamers of 11,000 tons each, placed by the Blue Funnel Line of Liverpool. Two of the vessels will be built by Harland, Wolff of Belfast. Harland and Wolff, incidentally are claiming a world's record for a single shipbuilding firm with an aggregate of 400,000 *tons on order.*

New Cunarder

The latest vessel to be completed by Harland and Wolff, the Cunard-White Star passenger and cargo liner Parthia, has been launched in Belfast. The Parthia, the third vessel in the Cunard postwar building program, is of 14,000 tons with a capacity 7000 tons of cargo. Considerable attention has been paid to accommodation of both passengers (numbering 250) and crew. Passenger accommodation—there is one class only—includes a high proportion of outside cabins, with private baths and showers, while the entire promenade deck is given over to public rooms, air conditioned throughout. Crew accommodation includes cafeteria, separate messrooms, two-berth cabins for the majority of enlisted men, with single cabins for leading enlisted men.

The naming ceremony was performed by Lady Brooke, wife of the Prime Minister of Northern Ireland.

Of 14,000 tons gross and carrying 250 passengers in extensively air-conditioned accommodation, the Parthia has space for 7,000 tons of cargo including 600 tons of refrigerated freight. The third liner in the Cunard White Star building program, this impression depicts the Parthia as she will enter service on the North Atlantic this summer alongside her sister ship Media now fitting out at Clydebank.

Passengers who travel aboard Britain's latest motor vessel, the Accra, will enjoy all the refinements of comfort which Britain's traditionally skilled craftsmen have been able to give her. Built for the Elder Dempster Lines by Vickers-Armstrongs, the Accra will eventually go into service on the Liverpool to West Africa service.

The Accra is twin-screw, driven by two Vickers Doxford diesel units totalling 9400 bph at 118 revolutions per minute. Overall length of the vessel is 471 feet with a moulded breadth of 66 feet. Displacement is 14,000 tons and there is a cargo space capacity of 278,000 cubic feet (baled). The spacious cabins are tastefully decorated, and are furnished with cot beds, large wardrobes, dressing tables, tallboy, washbasins with hot and cold water, mirrors, curtains, carpets, etc.

Cabins are provided for 245 first-class passengers in one-berth and two-berth rooms, and each cabin is fitted with a separate private bathroom or a shower cubicle. Cabins are also fitted for 24 third-class passengers on the main deck while arrangements have been made to carry 150 coastal passengers between West Africa ports on the upper deck, forward.

British Tanker Fleet

Anglo-Saxon Petroleum Company, who operate Britain's biggest tanker fleet, will replace all their ships lost in the war by the end of this year. The cost is estimated at £22,000,000 ($88,000,000).

When all building programs of British tanker fleets are complete—they involve nearly 300,000 tons of new ships—Britain will be operating the fastest vessels of this type in the world. One, the Helicina, flagship of the Angle-Saxon fleet, with a cargo capacity of 18,000 tons, has completed the voyage from Southampton to Curacao five days faster than the time normally taken.

From data furnished by the British Information Service, San Francisco.

COLVIN COMPARES CARGO CONDITIONS ON SHIPS OF U. S. AND EUROPE

O. D. Colvin, president of Cargocaire, and Sidney J. Duly, world famous English authority on the stowage of cargo, who collaborated with Mr. Colvin in the preparation of a paper on cargo stowage.

ON HIS RETURN FROM ENGLAND, where he presented a technical paper entitled, "Control of Humidity in the Cargo Spaces on Board Ship" before the North East Coast Institution of Engineers and Shipbuilders, O. D. Colvin president of the Cargocaire Engineering Corporation, commented on the favorable position of the American Merchant Marine in world shipping.

"American ship owners," Mr. Colvin stated, "will be pleased to know that their more modernly equipped vessels, resulting in superior outturns, are today attracting many cargoes which formerly went to the Scandinavian and British Merchant Marines. These countries have for generations produced highly trained crews and they still have an outstanding reputation for the skillful handling of difficult cargoes in all kinds of weather. As a result, there was a heavy movement of goods in prewar days to these lines."

Mr. Colvin went on to say that "despite the use of skilled personnel, there have been many occasions where even the best handling and the best knowledge are of no avail. Heavy weather which prevented the use of old fashioned ventilating systems forced many ship owners to fall back on the time-tried excuse of "inherent vice of the cargo' and 'peril of the sea'.

Today, the American Merchant Marine and the American ships equipped with the latest and the best system of dehumidification and ventilation are attracting new business by offering protection against all types of weather.

Among the recent costly examples that have brought this forcibly to the shippers' attention have been the heavy losses of oranges shipped from Jacksonville, Florida and the Mediterranean to Northern ports in Scandinavian ships, with losses running as high as 50 per cent. At the same time our own Lykes Brothers Steamship Company is regularly bringing in grapefruit from Texas ports and landing them at Antwerp with no loss. These grapefruit, shipped without refrigeration, are arriving in perfect condition in Cargocaire protected holds. Similar shipments of onions, oranges, apples and lemons by the American President Lines from our own West Coast to the Philippines have likewise arrived in perfect condition."

"A further example," Mr. Colvin said, "of how this system is drawing business was evidenced by the recent shipment of seed potatoes from St. Johns, New Brunswick to Montevideo, Uruguay, by Moore-McCormack in a vessel equipped with Cargocaire. A British line had previously rejected this same shipment of seed potatoes because they felt they could not warrant the risk. Incidentally, this shipment was inspected by the Administrator of Agriculture of the Uruguayan government who was aboard for this purpose, and he was highly pleased with the results.

Recently, a Moore-McCormack vessel landed fourteen million eggs in Sweden on one of their Cargocaire equipped vessels. At the same time that these eggs were being successfully transported, Scandinavian shipping lines were bringing in eggs with poor outturn."

"Commenting on the general shipbuilding conditions as he found them in Europe and Great Britain," Mr. Colvin pointed out that "despite her neutrality, Sweden while

Cargo Conditions on Ships of U. S. and Europe

striving to maintain its shipyards in high gear, is very troubled by the lack of labor and material. Orders are booked well into 1950 and they are falling behind from month to month in the delivery of electrical equipment." "Part of this," Mr. Colvin said, "was due to the fact that the recent heavy extension of credit to Russia had slowed up deliveries of components for Sweden's own ships. Some Swedish business men anticipated," he said, "that their large export trade with South America would suffer as a result of these commitments to Russia over the next five years. These same business men felt that the South American markets were now wide open for exploitation by American and British interests." "The British," Mr. Colvin said, "although geared to export commitments set at 175 per cent of their 1938 production have not been able to attain anything near this goal. Some British officials he talked to in the shipyards pointed out that the shorter work week in the mines and the five-day work week that was just started in British shipyards was definitely slowing down the entire shipbuilding program in Great Britain.

He was quite impressed with the fact that the British nation seemed tired and her people need a rest. The people in Norway, Denmark, Holland and Belgium, on the other hand, have snapped out of their doldrums and seem to be working with a great deal of zest. Mr. Colvin pointed out that the British people with their indestructible inner fibre will come back and buckle down to the job.

Mr. Colvin stated that many British ship owners who have been for some time observing the outstanding outturn of American ships, are now equipping their ships with Cargocaire to give assured protection and maintain their service at the high standards for which they have always strived. As a result of this interest, Colvin said that much business is coming to their British and Swedish affiliates, Cargocaire Ltd. in London and Cargocaire A.B. in Gothenburg. This will prove quite a boon to American shippers since they can be assured of good outturn of their products in all foreign ports.

"The Big Lift"

With her decks groaning under one of the strangest deckloads ever seen on a merchant vessel, the SS Joshua Thomas sailed for Greece during February from the Grove Street Pier of the Port of Oakland with three giant purse seiners on her foredeck and two more on her afterdeck.

Three of the purse seiners, the Sunset, Olympic, and Aldona, all are UNRRA cargo destined for Greece, were loaded aboard the Thomas in Seattle. The fourth, the Green Dolphin, 71-ton 63-foot boat, was taken aboard at the Grove Street Pier with the aid of a Smith-Rice Company derrick barge late Wednesday afternoon, February 5. The fifth, the 130-ton 71-foot Dolores B.—she has a beam of 18 feet 3 inches— was taken aboard in a delicate operation performed by the two giant Smith-Rice derrick barges.

Two slings were placed by the derrick barges under the forward and after sections of the fishing boat while it rested in the water alongside the Thomas. Then, in unison and very slowly, the two derricks lifted the seiner from the water, swung her over the side of the freighter, and deposited her gently like the others in a prepared cradle which was lashed to the deck. Also on board the Thomas was a cargo of lumber to be delivered to Italy and Greece.

STEAMSHIP ACCOUNTING

By ARTHUR B. POOLE,
Vice President and Treasurer
American President Lines, Ltd.

Arthur B. Poole, Vice President and Treasurer, American President Lines, Ltd.

THE STEAMSHIP INDUSTRY has two main divisions which are convenient to have in mind. One is the unsubsidized portion of the industry. Unsubsidized steamship lines include primarily coastwise and intercoastal lines, but also some lines running to foreign ports.

Coastwise and untercoastal lines are protected by cabotage, that principle by which the carrying of passengers or freight between domestic ports by vessels flying foreign flags is prohibited. Other nations, but by no means all of them, apply the principle of cabotage in their affairs. The most prominent maritime nation which has not so far applied cabotage to its water-borne commence is Great Britain.

The subsidized steamship industry is wholly composed of so-called "offshore" or "deep sea" lines, operating to foreign ports. An operating-differential subsidy is paid to these lines, after their routes have been determined essential in the foreign trade of the United States, to compensate them for the extra costs imposed on them by law. These costs include the use of American citizens in their crews, and "only articles, materials, and supplies of the growth, production, and manufacture of the United States . . . except when it is necessary to purchase supplies and equipment outside the United States to enable such vessel to continue and complete her voyage, and the operator shall perform repairs to subsidized vessels within the continental limits of the United States, except in an emergency."

These subsidized lines have certain accounting problems which do not devolve upon nonsubsidized lines. On the other hand, the accounting problems of nonsubsidized lines are completely shared by the subsidized lines. Accordingly, I shall discuss the special accounting problems and techniques of the subsidized lines, thereby automatically covering most of the accounting problems and techniques of nonsubsidized lines. Specifically, I shall present rather largely the accounting problems and techniques of my own company, American President Lines, because it is one of the very few steamship companies which before the war combined domestic business with subsidized foreign business. American President Lines carries intercoastel cargo and passengers as a substantial element in its Round-the-World and Atlantic-Coast-to-Straits-Settlements services, and may soon have an Atlantic-Coast-to-India service which will also include intercoastal traffic between the Atlantic Coast and California ports.

Operating-Differential Subsidy

During almost the entire history of the United States, subsidies in one form or another have existed for American-flag vessels. It is said that the first act of the Congress which met after the adoption of the Constitution in 1789, was to provide smaller port charges for American-flag vessels than for their foreign-flag competitors. Subsidies took various forms. At times it was a flat payment per annum for maintenance of certain transatlantic service. The last subsidy before the passage of the Merchant Marine Act of 1936 was a so-called "mail pay" which was measured by a combination of miles covered and vessel speed, and far exceeded reasonable compensation for the tonnage of mail hauled.

Under the prodding of President Roosevelt there was enacted by Congress in 1936 a Merchant Marine Act which established national policy: "It is necessary for the national defense and development of its foreign domestic commerce that the United States shall have a merchant marine (a) sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne export and import foreign commerce of the United States and to provide shipping service on all routes essential for maintaining the flow of such water-borne domestic and foreign water-borne commerce at all times, (b) capable of serving as a naval and military auxiliary in time of war or national emergency, (c) owned and operated under the United States flag by citizens of the United States in so far as may be practicable, and (d) composed of the best equipped, safest, and most suitable types of vessels, constructed in the United States, and manned with a trained and efficient citizen personnel. It is hereby declared to be the policy of the United States to foster the development and encourage the maintenance of such a merchant marine."

The Merchant Marine Act of 1936 recognized candidly for the first time that American standards of living and American wages were higher than in other maritime nations, and that if the Government was to require by law the use of American crews, American repair-yard artisans, and American manufacturers of equipment and supplies, there must be an "operating-differential" subsidy to offset the excess of the resultant costs over the comparative costs of foreign-flag competing vessels. Thus the subsidy is a subsidy to American workers, to get them to continue their efforts and experience in the American merchant marine, and is not in any real sense a subsidy to steamship companies. After receiving such subsidy payments, American steamship companies will still fail if their operations are not efficient and attractive to shippers.

Despite the apparent fairness of letting subsidized operators stand or fall on the basis of their success after equalizing their vessel-operating costs with those of foreign-flag vessels, the Merchant Marine Act says, in effect, that if a steamship company can earn more than 10 per cent per annum on its "capital necessarily employed" in the subsidized steamship operations, the subsidy is not really needed, and one-half of any such excess is recaptured by the United States as repayment of the subsidy. Consequently, most of the operating-differential subsidy paid by the United States from 1937 to the beginning of the war was recaptured, and the net cost to the Government of operating-differential subsidy was reduced to a very small amount.

Construction-Differential Subsidy

The Maritime Commission is also authorized to allow to American-flag operators on essential foreign trade routes a "construction-differential" subsidy, to offset the excess cost of vessels built in American yards with American workmen over the cost of similar vessels furnished by foreign shipyards to foreign-flag competitors. This likewise is a subsidy to American shipyard workers and equipment manufacturers rather than to the steamship companies. The Merchant Marine Act, for reasons of national policy, requires that subsidized operators use only American-built vessels on their routes.

During the war the Government took over all ocean-going vessels for its own use in the war effort, and steamship companies received modest charter hire for their vessels and closely regulated fees for their services. No subsidy was paid. The war period, however, is almost behind us and it is expected that in the next few months all steamship companies will recommence operations on a commercial basis. Hence, this paper is limited to steamship accounting as it will be carried on after the resumption of commercial operations. The subject divides itself naturally into four parts:

1. Accounts that go into an operating statement.
2. Accounts appearing in a balance sheet.
3. Steamship accounting methods and procedures.
4. Steamship cost accounting.

Accounts Related to Operating Statements

The Voyage as the Accounting Unit

From the oldest known days of ocean traffic down to the present it has been customary to account for vessel operations on what we call a "venture" basis. For this purpose the round voyage has been the unit. A round voyage is a voyage from a given port back usually to the same port, and it ends with the discharge of the homebound cargo, the new voyage picking up when loading for the next voyage begins. For practical reasons, the end of a voyage is taken as midnight of the day on which discharge of cargo was finished. In early days, when ownership of vessels was calculated in 64th fractions, there might be changes in ownership from one voyage to another. In the present day of corporate ownership of vessels changes occur infrequently, but the voyage has continued to be both the convenient and the logical unit of accounting for profits. Thus an operating statement contains the results of the voyages which were *completed* during the accounting period, and no allowance is made for the income or expenses of voyages commenced before or during that period but terminated even as little as one day after the close of the period.

The basic unit of the income statement is the "voyage profit." This is the net profit of a voyage after vessel and voyage expenses, but before depreciation, mortgage interest, advertising, overhead, and taxes. Vessel expense constitutes the direct cost of operating the vessel, including wages, fuel, lubricants, repairs, expendable equipment, stores, water, and provisions. Voyage expense comprises stevedoring, cargo checking, loss and damage claims, port charges, vessel insurance premium accruals, canal tolls, brokerage, and other direct expenses not actually a part of operating the vessel itself.

The Maritime Commission, through its General Order 22, has promulgated a complete system of numbered accounts to which subsidized lines must adhere in the rendering of quarterly and annual reports to the Commission. Steamship lines engaging in coastwise and intercoastal traffic in competition with railroad and truck lines are under the jurisdiction of the Interstate Commerce Commission, and must render accounts in accord with the ICC system of accounts for water carriers. Fortunately, the ICC has decided that any carrier obliged to render accounts to the Maritime Commission and the ICC both, such as American President Lines, may file with the ICC a copy of the report prepared under the Maritime Commission's General Order 22. The two bodies have consulted with each other to the end that the Maritime Commission reports will contain all information considered essential by the ICC.

Exhibits 1 and 2 include one sheet for direct accounting data, and one sheet for statistical and unit cost data.

(Please turn to page 138)

EXHIBIT 1

AMERICAN PRESIDENT LINES LTD — S. S. President Pierce
Route Transpacific

ANALYSIS OF EARNINGS AND EXPENSES — VOY. NO. 68-5

Estimate	Revenues:	
119,000.	R1 Freight	$137,998.28
30,000.	R2 Passenger First Class	60,144.34
27,000.	R3 Passenger Special—Tourist Class	30,792.49
13,000.	R4 Passenger Third Class	18,223.89
685.	R5 Baggage	1,189.44
5,000.	R6 Mail	6,719.10
878.	R7 Refreshments (Net)	1,524.93
74.	R8 Slop Chest (Net)	128.23
100.	R9 Laundry	172.62
513.	R10 Miscellaneous	892.52
196,250.00	Total Revenue	257,785.84
	Operating Expenses:	
9,494.	E10 Wages Deck	10,150.45
2,057.	E11 Equipment "	350.53
1,819.	E12 Supplies "	1,966.40
669.	E13 Rope "	56.17
124.	E14 Sundries "	84 66
14,163.	Total Deck Department	12,608.21
10,808.	E20 Wages Engineers	10,729.14
177.	E21 Equipment "	197.14
37,298.	E22 Fuel "	40,344.33
279.	E23 Lublication "	450.45
491.	E24 Water "	476.68
1,884.	E25 Supplies "	3,856.15
50.	E26 Sundries "	491.89
·0.987.	Total Engineers Department	56,545.78
17,075.	E30 Wages Stewards	17,011.13
2,025.	E31 Wages Pursers	2,075.00
18,897.	E32 Provisions	22,820.82
1,494.	E33 Equipment Stewards	1,458.91
714.	E34 Crockery, Silverware and Glassware	487.52
1,679.	E35 Linen and Bedding	1,695.62
1,921.	E36 Supplies Stewards	2,358.70
803.	E37 Sundries Pursers and Stewards	1,170.78
44,608.	Total Pursers and Stewards Dept.s	49,078.48
	E40 Repairs, Hull and Deck Dept	2,955.86
	E41 " Boilers and Condensors	1,422.72
	E42 " Main Engines	1,162.16
	E43 " Deck and Auxiliary Mach	2,191.10
	E44 " Radio and Electric	417.02
	E45 " Stewards Dept.	4,914.44
	E46 " Drydocking—Extraordinary Repairs (Accrual)	
20,000.	Total Repairs	13,063.30
6,035.	E50 Insurance, Marine	6,354.92
1,768.	E51 Insurance, Protection and Indemnity	1,589.90
50.	E52 Personal Injury	2.89
330.	E53 Stationery and Printing	505.07
8,183.	Total Other Vessel Expense	8,452.78
137,941.	Total Vessel Expense	139,748.55
23,595.	E60 Stevedoring	33,082.15
484.	E61 Restowing and Misstowed Cargo	579.87
3,267.	Clerk Hire	4,111.35
2,904.	E63 Wharfage, Lighterage and Handling	2,681.07
2,420.	E64 Cargo Sundries	4,339.32
2,000.	E65 Loss and Damage Claims	2,133.47
34,670.	Total Cargo Expense	46,927.23
2,736.	E70 Pilotage, Towage and Launch Hire	1,730.43
3,815.	E71 Dockage	3,731.89
1,869.	E72 Tonnage Dues and Canal Tolls	1,263.91
2,698.	E73 Quarantine, Customs & Consular Fees	3,329.00
11,118.	Total Port Expense	10,055.23
45,788.	Total Cargo and Port Expense	56,982.46
126.	E80 Brokerage, Freight	247.42
1,800.	E81 Brokerage, Passenger	2,249.51
	E82 Agency Fees	
580.	E83 Commissions, Freight and Mail	537.03
42.	E84 " Passenger	50.72
	E85 " Disbursing	
2,548.00	Total Commissions Expense	3,084.68
	E90 Advertising	1.82
1,000	E91 General Expense Sundries	1,205.31
1,000	Total General Expense	1,207.13
49,336.	Total Voyage Expense	61,274.27
187,227.00	Total Operating Expense	201,022.82
8,973.	Voyage Profit (Loss)	56,763.02

P VOY. ENDED 10/1/39 — SUBSIDY ACCRUED $42,923.64

EXHIBIT 2

AMERICAN PRESIDENT LINES LTD. — S. S. President Pierce
Route Transpacific

Estimate	VOYAGE STATISTICS	VOY. NO.68-5API
	Service (F—Freighter, F & P—Freight & Passenger)	F & P
	Date Voyage Began	8/7/39
	Date Voyage Ended	10/1/39
	No. of Nautical Miles Traveled	16,534
42	Running Time—Days	41
14	Port Time—Days	15
56	Total Number of Days	56
	Cost Per Day, Vessel Expense	
2,622.57	Cost Per Day, Vessel—Running	2,688.88
1,984.48	Cost Per Day, Vessel—Port	1,980.58
	No. of First Class Passengers	271
	No. of Special Class Passengers	
	No. of Tourist Passengers	269
	No. of Third Class Passengers	317
	No. of Steerage Class Passengers (Asiatics)	
	No. of Non-Revenue Passengers	
	Total Passengers	857
	"Cabin Menu" Meals Served Passengers	24,396
	"Cabin Menu" Meals Served Officers & Crew	32,424
	"CabinMenu" Meals Served Free	362
	Total "Cabin Menu" Meals Served	57,182
	"Crew Menu" Meals Served Crew	6,384
	"Crew Menu" Meals Served Third Class Passengers	1,035
	Total "Crew Menu" Meals Served	7,419
	"Asiatic Food" Meals Served	10,862
	Total Meals Served Passenger & Crew	75,463
	Cost Per Meal—Provisions	
	"Cabin Menu" Meals	35
	"Crew Menu" Meals	25
	"Asiatic Food" Meals	
	Average Cost Per Meal—Provisions: All Meals	30
	Cost Per Meal—Steward's Wages	23
42	No. in Deck Crew	42
48	No. in Engine Crew	51
126	No. in Stewards Crew	128
9	No. in Pursers Crew	9
225	Total Crew	230
	Fuel Purchases and Consumption	
	On Hand Beginning of Voyage—Bbls.	4,371
	Bbls. Purchased at Boston (Price Per Bbl. $.........)	
	Bbls. Purchased at New York	
	" " " Cristobal	
	" " " Balboa	
	" " " Los Angeles .721	21,555
	" " " San Francisco .812	5,010
	" " " Honolulu 1.13	9,549
	" " " Yokohama	
	" " " Hong Kong 1.76	5,001
	" " " Manila	
	" " " Singapore	
	" " " Bombay	
	" " " Port Said	
	Total Barrels On Hand Beg. of Voy. and Purchased	45,486
	On Hand End of Voyage—Barrels	3,248
39,250	Consumption Round Voyage—Barrels	42,238
36,490	Barrells Consumed — Running	39,027
2,760	" " —Port	3,211
869	Consumption: Barrells Per Day—Running	952
197	" " " " —Port	214
	" " " " —Steaming Mile	2.36
	" " " " —Engine Mile	2.05
	Slip %	
95	Average Cost Per Barrel	•96
12,100	No. of Revenue Cargo Tons	16,263
	No. of Non-Revenue Cargo Tons	
9.83	Average Rate Per Revenue Ton	8.49
2.87	Cargo Expense—Cost Per Ton	2.89
95%	% Total Operating Expense of Total Revenue	78%
1,667.	Crew Overtime—Deck Dept.	3,396.53
1,121.	" " —Engine Dept.	1,781.86
903.	" " —Stewards	2,122.60
3,691.	Total Overtime	7,300.99

P VOY. ENDED 10/1/39 — SUBSIDY ACCRUED $42,923.64

. . . With The Port

E. C. Rechtin, manager of San Pedro yard, Bethlehem Steel Company, Terminal Island, California, guest speaker at Society of Port Engineers meeting.

E. C. Rechtin of Bethlehem Addresses L. A. Port Engineers

"WELDED STEEL MERCHANT VESSELS—Their Construction and Repair" was the topic of E. C. Rechtin, manager of the San Pedro yard of Bethlehem Steel Company, before the well-attended monthly meeting of The Society of Port Engineers at Los Angeles Harbor on April 2. Mr. Rechtin's highly informative talk accompanied by excellent illustrations, proved one of the most timely talks the Southern California maritime fraternity has enjoyed in a long time.

President Paul V. Gaudin, who also is Superintendent of Engineering and Maintenance for the American Pacific Steamship Company, presided at the meeting, which was high-lighted by a dinner at the Lafayette in Long Beach.

Paul V. Gaudin, superintendent of engineering and maintenance, American Pacific Steamship Company, and president of the Society of Port Engineers, Los Angeles Harbor.

Dan Dobler, marine superintendent of The Texas Company, is chairman of the Board of Governors of the Society of Port Engineers at Los Angeles Harbor, Leonard E. Landers, port engineer for American President Lines, is vice president, and George A. Robinson, marine surveyor is secretary.

The Board of Governors is comprised of George Curran, R. H. Cyrus, Charles Jackson, M. H. Kelley, C. V. Peterson and J. L. Wosser.

Charter Members are William Anderson, Roy Campbell, George Curran, R. H. Cyrus, Dan Dobler, H. Dreggors, Charles Duggan, Paul V. Gaudin, Spencer Gordon, Glenn Gulvin, B. L. Hale, Edward L. Harris, Charles Jackson, M. H. Kelley, Leonard E. Landers, H. E. McEwing, Harry Miller, H. Neergaard, T. T. Overton, C. V. Peterson, Lloyd Richardson, C. P. Snively, David K. Steward and J. L. Wosser.

Honorary Members are Harry Summers, Joseph T. Hare, Lloyd Kennedy, Frank Boomer, George McLean and P. Banning Young.

Dan Dobler, marine superintendent, The Texas Company, chairman of the Board of Governors, Society of Port Engineers, Los Angeles Harbor.

Engineers . . .

Maintenance Problems On the Modern Two-Cycle Marine Diesel Engine

By GEORGE H. LIENHARD,

Installation & Service Engineer, Heavy Machinery Division, Nordberg Manufacturing Company.

WHO'S TELLING WHO WHAT?
Left to right: Joe Gisler, of Interocean; M. T. J. Garlinger, Army Transport; and Charles Cox of Nordberg.
—*Pacific Marine Review Photo*

At the April 2 meeting of the Society of Port Engineers, San Francisco, held at the Marconi Restaurant, President Frank Smith presided over an extremely informative session on diesel engine maintenance. The many questions of the members were ably answered by the speaker and by Charles Cox, Pacific Coast manager of Nordberg Manufacturing Company.

WHENEVER MARINE DIESELS ARE DISCUSSED, the problem of maintenance is always the main topic. The maintenance referred to is usually considered excessive but the reference is always to an engine built between 1920 or 1930. The modern diesel is far different from the early diesel, and yet it is surprising how often today's diesel is thought of in terms of the old and obsolete design. The modern diesel is so developed that simplicity and standardization of parts eliminate the need of costly repairs. Many of the problems of that era no longer exist in modern marine diesels. In order to draw a comparison I will discuss the maintenance problems of that period and maintenance problems on the modern marine diesel.

J. A. Reimers, secretary-treasurer of the Society of Port Engineers, San Francisco; the guest speaker George H. Lienhard, and Society president, Frank W. Smith.

—*Pacific Marine Review Ph*

With the Port Engineers

What were the problems in the older marine diesels built in 1925?

Well, No. 1 was air compressors. The modern marine diesel operates without an attached air compressor. There are practically no modern marine diesel engines operating as air injection engines today and none are built in this country for marine purposes. The solid injection engine has proven to be the simplest of the two types of fuel injection. Even the heaviest kinds of fuel can be burned in a solid injection diesel. It is merely necessary to thoroughly centrifuge the fuel and then heat it to the proper viscosity so that the fuel system can handle it. With the air compressor eliminated all of the associated troubles are eliminated, and the power absorbed by the compressor goes into the shaft.

You might ask the question. "You still have a scavenging pump? What about that?" True, the scavenging pump is still a low pressure air compressor but it offers no maintenance problems because it operates at pressures of only 2# to 2½# instead of 1000# to 1200# pressure. If the pressure is low the temperature will be low, so no cooling is required. Troublesome coolers and high pressure valves are no longer present. The scavenging pump that is used on the Nordberg two-cycle marine diesel consists of a regular marine type crank, wrist pin and crosshead slide construction and the piston is a solid aluminum plug with no piston rings. The piston has a clearance of .025″ and is guided by a tail rod on the piston rod, and never touches the cylinder wall, therefore there is nothing to wear out. The loss in power due to leakage past the piston is less than the friction loss if we were to use piston rings in a cylinder of this size. Maintenance on the scavenging pump bearing and guides is no different or more difficult than any other bearing or crosshead. The piston rod packing is similar to any other packing. It is a series of carbon rings, held in place by garter springs and since these operate under low pressures and temperatures they last indefinitely. The packing should be inspected about once a year, which is about a one-hour job. The suction and discharge valves on this pump are merely strip valves, or feather valves, as they are sometimes called. To keep them operating efficiently, the entire valve assembly can be removed from the pump, soaked in kerosene or other solvent to remove the accumulation of dust and dirt. This should be done about once each year.

On larger engines, independent centrifugal scavenging blowers are used. These are driven by electric motors or small steam turbines. Steam for driving the turbines can be generated by the heat from the diesel exhaust passing through a waste heat boiler. On good installations as much as 5 per cent of the total heat can be recovered from the exhaust and used to operate bilge pumps, transfer pumps or other auxiliaries, as well as heat the quarters.

Large double acting diesels used to be plagued with piston rod and piston rod packing trouble. The modern single acting two-cycle diesel does not have these troublesome parts. Conservative American diesel engine builders, have in general, adopted the single acting engine for marine purposes. Few, if any double acting engines are offered.

Another problem was cylinder heads. This was a real headache because of the many valves and apertures in the old style four-cycle head. Four-cycle diesels are no longer used for main propulsion on large motorships in America, and the cylinder head on the modern two-cycle diesel has only two openings in the entire head. One opening is to receive the fuel injection nozzle and the other opening is for the passage of starting air into the cylinder. This same opening also serves as a passage to the cylinder head relief valve. Due to the less complicated head, better and more even cooling is provided. Extremely large radii may be used on the apertures in the head, and this feature, with the better cooling, eliminates the source of the cracking common to older type heads.

Old time cylinder heads usually cracked between the fuel nozzle opening and the exhaust valve opening. This trouble cannot occur on the cylinder head of a two-cycle cylinder head because there are no exhaust valves. This type of head is fitted with a removable bushing where the injection nozzle is fitted. This bushing is essentially a cooling bushing for circulating water around the nozzle. Should a crack appear in this type of head, it would start in the center where the fuel injection cooling bushing is placed. The bushing can be removed and a spare one installed in less than an hour without disturbing the cylinder head itself. By reducing the number of openings in the cylinder head to a minimum, you reduce the possibility of cylinder head failures to a minimum. It goes without saying that when intake and exhaust valves are removed, numerous maintenance problems are solved. With the valves out of the cylinder head, there are no valve motions, links, push rods, etc., to wear out. Dozens of moving parts are eliminated.

However, on small four-cycle diesels, these parts do not present a major problem because of their relatively small size. On an engine of several thousand horsepower, these parts are of prohibitive sizes and weights.

Bearings were a problem in those days due to high bearing pressures and difficult lubrication. The modern marine diesel is lubricated by a forced-feed oiling system, and much knowledge in lubrication has been offorded the diesel operator and manufacturers by the leading oil companies. Improvement in quality of bearing alloys and lubricating oil has meant improved performance of all types of prime movers, especially the diesels.

The main trouble experienced in those days was the fact that if a main bearing burned out or wiped, it meant removing the crankshaft to repair the bottom side of the bearing. Today's diesel, even the large sizes up to 8500 horsepower are fitted with removable precision type bearing shells. A complete set of main bearings can be removed and replacements installed without disturbing any more of the engine than the bearing cap itself. In these types of engines, all of the bearings are interchangeable, which means that spare parts supplies can be reduced to a minimum.

Precision bearings are also used on the connecting rod bearing and the wrist pin or crosshead bearing. These parts are also interchangeable. For example, individual fuel pumps for all cylinders are interchangeable, so are cylinder liners, fuel injectors, valves, main and connecting rod bearings, and cylinder heads. Standardization of parts has reduced maintenance costs.

Piston heads no longer present the problem they did 20 years ago. Increased knowledge of metals and alloys, along with improved designing skill, have made the piston head practically fool proof. Pistons are now oil cooled instead of water cooled, which eliminates a lot of troublesome mechanism for getting water in and out of the piston instead of into the crankcase. In oil cooled pistons the oil is introduced to the piston through the connecting rod and spills out through a telescope pipe into the crankcase. This telescope outlet pipe is fitted with about 1/32″ clearance and requires no packing glands, consequently it never touches any other moving part. Therefore no maintenance is required. Since there is no water piping in the engine crankcase, shut downs due to water in the lube oil are eliminated. The whole system of engine cooling and lubrication, and attendant pumps required, is simplified by using the one system.

Pistons should be pulled about every 3000 to 5000 hours depending upon running conditions. A piston can be pulled, rings changed, connecting rod bearing inspected, all in one working day by the engine room crew. The modern marine diesel has been developed to a state of simplicity whereby nearly all repairs can be made by the ship's personnel. When pistons are pulled, only the worn or broken rings should be renewed. Most engineers make the mistake of renewing all of the piston rings just because they have gone to the trouble of pulling a piston. New rings have to wear in and therefore increase the wear of the liner. Another important reason for pulling a piston is to examine and clean the intake and exhaust ports. Fouled ports restrict the input of scavenging air, which will reduce the output of power. It is important to pull pistons when necessary and the regular use of the indicator will tell you what is going on inside the cylinder. There is no use in pulling a piston just for the sake of pulling it.

Lubricating oil consumption has been reduced to a reasonable quantity by improved oil control piston rings and controlled introduction of cylinder lubrication. Cylinder oil for lubricating the piston rings is introduced by means of a timed lubricator, set to inject the lubricating oil into the piston rings when the piston is near top center. The lubricating oil holes in the liner are placed so that the oil is equally distributed around the entire periphery of the cylinder. Therefore, the cylinder oil is injected when it is needed, where it is needed.

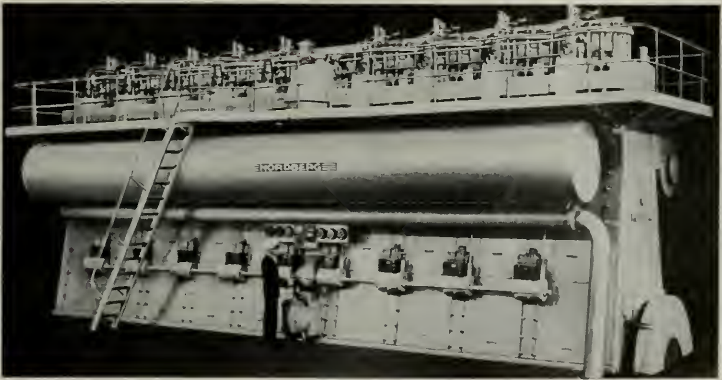
Lubricating oil consumption is in the neighborhood of 6000 horsepower hours per gallon on the trunk-piston type of diesel, and even better on crosshead types. With proper cylinder lublication, liner wear is considerably reduced. The average wear of a trunk piston liner rarely exceeds .002″ per thousand hours of running time. Assuming that a motor vessel operates 5000 hours a year with a rate of wear of .002″, which is the maximum rate, that would be .010″ wear per year. We usually recommend renewing a liner after the wear has reached .125″. This would mean that a liner should last at least 12 years. The changing of a liner is not a difficult job and can be performed by the ship's personnel in a matter of 24 hours, with the use of proper tools which are furnished with the engine for that purpose.

Fuel Oils

The question is asked, "Why don't diesels operate on heavy oil?" The answer is, "They do", and the modern marine diesel that cannot operate on heavy oil should not be called a modern engine.

The large marine diesel that does not operate on

(Please turn to page 134)



The 9-cylinder Nordberg diesel on the Emory Victory. This is the engine that made the records quoted in the text.

Setting foundation blocks on bottom of drydock. Ship will eventually be supported by these blocks. They have to be aligned in such a manner as to conform to the vessel's underwater body shape. Drydock engineer is setting heights of blocks with surveyor's transit.

Leo Quayle and Harry Holmes, drydock control operators, at pump and valve controls which regulate amount of water in various compartments of the dock while ship is being raised or lowered. Dock has 16 compartments.

Dock being lowered. Dock is rapidly sinkin and is going down at the rate of 2 feet per minute.

THE FLOATING DRYDOCK—A VITAL FACTOR IN TODAY'S SHIP REPAIR PROGRAM

By R. A. FORSTER, General Superintendent, Bethlehem Steel Company, Shipbuilding Division, San Francisco Yard

With the current need for freight and passenger vessels in transpacific operations so acute, the floating drydock becomes a vital factor in speeding up ship repair activities. In general, there are three methods of drydocking a ship in operation today, the floating dock, the marine railway and the graving dock, the latter, in brief, consisting of an excavation at the shore line into which a ship is floated and from which the water is pumped after the vessel has been properly docked. While the ship is on this type of dock, water is prevented from coming in by hinged doors or locks, called caisson gates.

The floating drydock, however, is much more widely in use today and is speedier and more versatile in operation in that it can be towed to any desired location.

History tells us that before floating drydocks and graving docks were ever heard of, sailors would beach their ship at high tide, moor it and when the tide receded would get at one side of the vessel's bottom. When

Dock fully submerged and awaiting vessel.

James Nelson, Asst. Dockmaster, in operations headquarters directing movement of vessel as it is entering dock. He can talk with the entire dock and vessel by means of a P. A. system.

Ship entering drydock. Movement still under of towboats.

Lines have now been passed aboard ship from dock and ship is now under control of dock hands.

Ship being pulled into docking position with the aid of lines fastened to capstans on drydock.

Ship is now in position above blocks and dock will be raised to land her on foundation blocks.

the next tide came in, they would arrange for the ship to settle on the other side, thereby completing the operation.

The marine railway came next. This is a sloping trestle extending from the shore into the water and on which steel tracks are built. The ship is maneuvered onto a wheeled cradle and hauled out of the water and up onto the trestle where its underwater section can be worked on.

An interesting side light on drydocks in general is the hydraulically operated dock built at Bethlehem Steel Company's San Francisco Yard (then the Union Iron Works) toward the end of the last century. This dock, the only one of its type in existence, was raised or lowered hydraulically. It was destroyed, however, in the earthquake of 1906.

Generally speaking, a ship may be drydocked as often as every 6 months for either one or several reasons: for removal of underwater growth, painting, inspection for shaft or rudder weardowns, renewal of stern tube packing, renewal of sea valve packing or for repairs of bottom damage caused by grounding or heavy weather. With the standard application of first one coat of anti-corrosive paint and then a coat of anti-fouling paint to the vessel's underwater section, speed of the ship is increased considerably.

An important advantage of the floating drydock over the graving drydock is the time that can be saved in docking the ship. In addition, the floating drydock is more versatile in that it can be tipped so as to match the trim of the ship being docked.

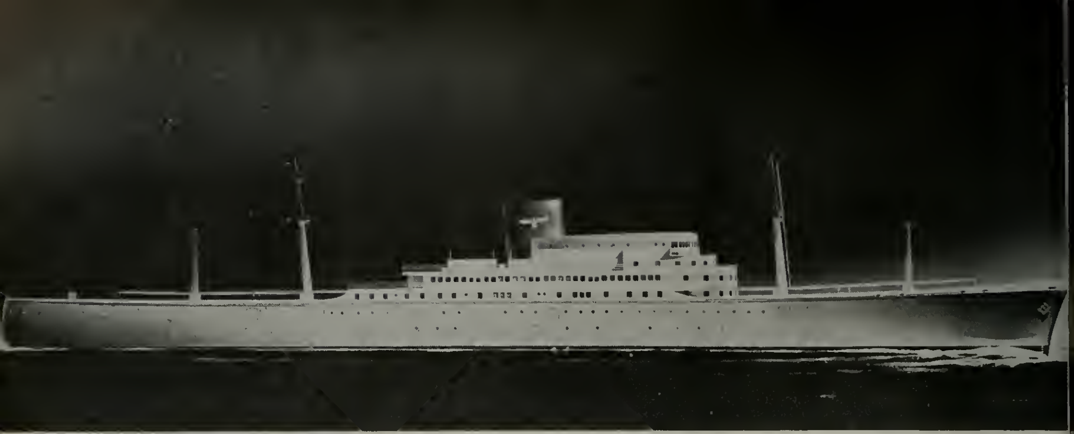
The floating drydock consists of one or a series of pontoons with upright wing walls on the sides. So that the dock can sink low enough in the water for a ship to be floated in, water is allowed to enter the pontoons by means of flooding valves. When the ship which is supported on blocks on the deck of the dock is to be raised, the pontoons are pumped out and the dock rises through

(Please turn to page 142)

Dock is being raised with vessel secure on blocks. Ship is centered by means of plumb bobs at each end of vessel.

Vessel is now entirely out of water.

Painters cleaning bottom before application of bottom paint. Man with long marker stick is marking deep load line on the ship's bow.



Maritime Commission approved V-2000 type ship for Round-the-World Service.

V-2000 ROUND-THE-WORLD SHIPS APPROVED FOR BIDS

THE MARCH PACIFIC MARINE REVIEW contained a detailed technical article, with inboard and outboard profiles, deck plans, and machinery arrangement plans of five proposed combination passenger cargo vessels for American President Lines' Round-the-World service.

These five vessels—known as the V-2000 type—are to replace five combination passenger-cargo liners taken over by the Navy at the outbreak of war and not returned. The new vessels will be larger, both in passenger and freight accommodations, to take care of the expanding Round-the-World trade, and will fulfill a portion of American President Lines' progressive postwar plans.

Just prior to Pearl Harbor, American President Lines had taken delivery of seven new de luxe President Liners for their Round-the-World service, rated by the Maritime Commission as one of the essential American flag services.

All seven of these fast new liners—known as the C-3-P type—went to war, and only two returned—the President Polk and the President Monroe. These two vessels, reconverted to commercial use, have since been operating on a limited and unbalanced schedule around the world, each with accommodations for only 98 passengers.

American President Lines' contract with the Government for servicing of the strategic Round-the-World route specifies the operation of a minimum of seven combination passenger-cargo vessels. Construction of the five new ships will bring the globe-circling fleet up to required quota and enable the company to meet the heavy traffic demands from shippers and travelers over this route. For a time this essential new construction appeared threatened by a slash in the Maritime Commission's budget.

The Maritime Commission's action in approving the call for bids followed receipt of an application for differential subsidy aid in the construction of these ships by the American President Lines, Ltd., who will purchase them outright from the Commission.

Details of the V-2000's are:

Length:	536 feet over-all—44 feet longer than the C-3-P-s
Beam:	73 feet
Speed:	19 knots, cruising
Passengers:	189, all first class. This is 103 more than was carried by the C-3-P's
Gross Tonnage:	11, 250 tons
Deadweight Tonnage:	11,660 tons

The Commission said that it was possible that contracts could be placed for these ships under the present contract authority since up to the present time no applications had been received for such aid in constructing six new type C-3 cargo vessels previously contemplated.

The Commission explained that the pricipal need now is for passenger and combination passenger-cargo vessels, and with the receipt of an application for construction aid, on ships of this type, it was decided to call for bids on the V-2000's at this time rather than for the C-3 cargo vessels for which no applications had been filed.

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

San Francisco World Trade Week Committee Chairmen

Seated (clockwise) around table, left to right: John E. Fields, Far East Trader (Publicity); Frank Hoper, Bank of America (International Education Day); Richard S. Turner, Adams-Turner Co. (Special Events); Donald W. Chapman, W. R. Grace & Co. (International Education Day); Florian Frank, Parrott & Co. (Radio); Allen A. Eber, Polak-Winters Co. (Speakers); Elliott McAllister, Bank of California (Finance); Arthur M. Poole, American President Lines (Vice Chairman); Frank Di Marco, Frank Di Marco Co. (Maritime).

Standing (left to right): Connie J. Grabb, General Mills (Essay Contest); Belford Brown, S. F. Bank (Iternational Trade Day); Don Wiley, Pan American Airways (International Aviation Day); Voit Gilmore, Pan American Airways (International Aviation Day); William Loomis, S. F. Chamber of Commerce (Secretary); Ray E. Waterlow, Marsman Co. of California (General Chairman).

Not in picture: Albert M. Gatov, Pacific American SS Assn'. (Maritime); Lewis A. Lapham, American-Hawaiian SS Co. (Maritime Day); Alvin C. Eichholz, S. F. Chamber of Commerce (Coordinator); Fred Galbreath, Marine Office of America (International Dinner); C. E. Young, Pan American Airways (International Aviation Day).

A. Viola Smith

CURRENT INDUSTRIAL PROSPECTS IN CHINA

By VIOLA SMITH,* President Anselm & Co., Inc.

THERE WAS AN IMMEDIATE POSTWAR tendency for American business interests to rush back to Shanghai immediately after V-J Day. Chinese interests from West China and overseas did likewise. In their minds, Shanghai was as they had left the city, no matter what the year. But on return, to their amazement, they found vast changes. Disillusionment set in. The city was overcrowded—four million people had converged on the center of Shanghai. The city looked down at the heel—pedestrians and hawkers swarmed both sidewalk and streets; traffic was bedlam; hotels, clubs, residences, office quarters were occupied by military, naval, UNRRA or other personnel. There was no place to live.

Deterioration was evident everywhere. Properties, whether foreign or Chinese, had to be repossessed through cumbersome procedure of the Alien Property Administration. The city, instead of being two orderly foreign settlements as of old, was now under Chinese Municipal Administration, which had fallen heir to the chaos brought by years of Japanese and puppet occupation. Familiar French and English names of thoroughfares had been replaced by the puppets with unaccustomed Chinese names. There was no familiar hong list. The only telephone directory available until recently was a 1943 Japanese edition which contained no American, British or other allied names, nor the new Chinese firms. Telephone lines were at a premium; exchanges heavily overburdendened and dial service exasperatingly slow; though the Shanghai Telephone Company had done a magnificient job in rehabilitating its service. How to find who and how to get to where, was throughout last year, a major struggle. The daily problem of just living has been a nightmare to many. House or office space can seldom be acquired without payment of "key money"—$10,000 U. S. dollars being a nominal figure. Wages have skyrocketed; cost of living index soared to over six thousand times the prewar base. Strikes and labor demonstrations have been prevalent. Extraterritoriality was out. Though now, there had been very little realization of what it would mean in the everyday life of Shanghai.

The city had lost its international complexion—it has assumed a definite Chinese garb. Municipal and public services were at a low ebb; public transportation services were overcrowded. War vessels swarmed the harbor. Merchant vessels lay off Woosung for days even weeks before being able to come upstream for berthing and discharge of cargo. Wharves were piled high with American military, naval and UNRRA supplies. Lighterage and tug services were meager; pilferage was rife; but so was it at Manila and other foreign ports and even in New York harbor, according to recent newspaper reports.

Old time procedures at Shanghai were upset. There were controls—foreign exchange and foreign trade control, import licensing, restrictions on internal travel, police registration certificates to be obtained, inland transit visa procured before embarking on travel from Shanghai and exit permits when going abroad, quarantine regulations and a host of regimentation which Americans were not accustomed to when previously living in China. And there were taxes! Chinese taxes! National income taxes, business taxes, excess profit taxes, not applicable to extrality foreigners in prewar days. New administrative bureaus; unfamiliar Chinese laws, new officials—many non-English speaking; and a greater use of the Chinese national language in official communications.

New forms of competition had arisen. UNRRA, CNRRA, Foreign Liquidation Commission, Chinese Government, new Chinese private interest. Shanghai certainly was not China to many an Old China Hand—nor by hearsay to the new China Hand!

In brief, most westerners and many Chinese had not

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*In Part, an address before the Oakland Foreign Trade and Harbor Club, April 3, 1947.

made the mental readjustment necessary to take conditions as they found them in the immediate postwar months at Shanghai. Americans and Britishers especially were not accustomed to the status of being aliens at Shanghai. But today, foreign interests in China, or those expecting to go there, must make this psychological adjustment; for to live and do business in China now requires acceptance to the fact that one does so in a sovereign foreign state. Expressions of nationalism do not necessarily mean anti-foreignism, though they may be mistaken at times as such.

Yet amidst all this confusion progress has been made. Both Shanghai and Nanking have held their first municipal elections and are now governed by popularly elected city councils. Shanghai is getting to grips with its own problems. A delegation of eleven city councilors composed of private businessmen, commercial bankers and professional men, despatched to Nanking to petition the National Government for changes in central government policies which in their opinion would accelerate the rehabilitation of Shanghai trade, industry and economic life, commanded respect and consideration, as it represented outstanding public opinion of the Shanghai electorate.

The Chinese economic scene presents many anomalies. It is a fallacy to take prewar years as a basis of comparison. Taking V-J Day as the basis, (when all eastern China was prostrate) there is progress to be noted in many directions. True, the rate of progress has not been as rapid as might be desired, but progress there is. There are greater transportation facilities available than fifteen months ago—though still woefully inadequate to meet the needs. Highways and railways are gradually being improved in South, West and Central China. Water transportation has been accelerated.

Trade controls instituted in China since V-J Day are sort of "delayed action" in nature, as their institution and impact was not felt by either Chinese or foreign concerns until trade reopened at Shanghai early in 1946. Most Chinese and foreign merchants had little conception of the extent to which wartime trade controls operated in America, and other countries. China in prewar days being singularly free of controls, merchants have writhed over the attempt of the government to put economic controls into operation during the immediate postwar period. On the other hand China has been severely criticized in some international conferences, because she did not rigorously institute national rationing and price controls.

It may reasonably be said that in China's immediate postwar period exchange and trade controls have been necessary for the over-all position, no matter how irksome controls may prove to be individually. As the international monetary machinery is perfected and functions, and as the world trade organization is developed, and China gears into these systems China will be in a position to relax her unilateral exchange and trade controls.

One hears much about government controls and monopolies, yet a clear distinction should be made between monopolies per se and new forms of competion which have arisen both from Chinese private enterprises, and from Chinese governmental operation in fields which sometimes parallel but do not exclude private operation. Sweeping generalities about state control of industry and trade in China can too easily befog long range concept. It is generally conceded that "the political and economic set-up within any country is solely a matter for the people and the government of the country to decide upon."

What then is China's policy? This is no mystery. The 1936 Draft Constitution outlined the basis for China's national economic life, predicated upon Sun Yat-sen's doctrine of 1921. It has been there for all to see, though all too little realization by foreign traders of this significant fact, mainly because so long as extraterritoriality prevailed, foreigners by and large did not concern themselves with China's evolving political economic development. How rapidly, how perfect, or how liberally the economic principles of the new 1946 constitution will be extended or enforced depends upon the cohesion with which China may achieve internal unification; plus the freedom which she will have from extenral strife.

What then do we do about it? First, have an apprecia-

Harbor at Shanghai

Current Industrial Prospects in China

tion of what the basic policy is, and then develop such policies and trading techniques as will still permit our carrying on mutual trade with China.

The signing at Nanking on November 4, 1946 of the new commercial treaty between the U.S.A. and China is the most far reaching event which has occurred for American traders since Pearl Harbor. It gives a coverage for business more comprehensive than any commercial treaty previously concluded; and extensively deals with exchange restrictions, trade controls and monopolistic tendencies. The new treaty is a network of beacon lights by which American firms may with assurance chart their future course for China trade. The Chinese government ratified the treaty four days after its signing. But we still await upon the pleasure of the American Congress to ratify this important instrument before this significant treaty may become operative. A reciprocal trade agreement is also under negotiation.

For a hundred years foreign firms with established offices in China had a wide open field. Their competition was mainly amongst themselves, competing actively for Chinese business. Today foreign firms in China are for the first time in their existence face to face with active, vigorous Chinese competition. The laissez faire days of the compradore are gone. The third and fourth generation of the Compradore's son with western education and technical training are taking their rightful position in the new commercial industrial fabric in China.

Formerly there were exceptionally few Chinese firms engaged in foreign trade. There however grew up during war days in Free China (when most foreign firms did not maintain offices in Chungking) a new grouping of Chinese firms. To get commodities in and out of China required great ingenuity. These groupings gained an experience which is now making itself felt in Shanghai upon both old established foreign firms and "old style" Chinese hongs. Today there are numerous Chinese trading houses in Shanghai, having either branches or strong interior connections, and some with offices in India, London and New York. These concerns are well staffed with western trained Chinese, with experienced Chinese personnel drawn from foreign concerns in China, and in some instances with foreign technicians. You have here what is colloqually known as "The compradore in reverse." Many of these Chinese concerns are financially strong and influential in private industrial and banking circles as well as in governmental realms. "Big Chinese Business" has "moved in" on the field of competition which in prewar days was almost an exclusive preserve for foreign trading houses. The rise of these new Chinese firms cannot be discounted. Some foreign trading concerns are meeting this challenge more quickly than others. Some are gingerly making experiments. Others are holding off, wishfully hoping for this new phenomenon to recede.

There is also a great evolution going on in the channels of distribution, which is a serious factor for many old line foreign trading houses in China, but not necessarily detrimental to American trade in the long overall objective. In former days, most foreign firms decried the fact that they could not get volume distribution in the interior, having to depend upon the old style Chinese dealers. But many of these new Chinese firms give this broadened outlet for American products, because these more modern Chinese business men, during the wartime, learned of the possibilities of their own hinterland, and are gearing themselves up to pushing and expanding trade into those areas. Moreover, the Chinese firm more readily adapts itself to interior conditions, than can any foreign firm or foreign staff. In the face of the shortage of transportation facilities, the stronger of these Chinese private concerns have purchased ships from abroad and operate their own steamship services to ensure transportation for their cargoes. Others have tie-ins with private Chinese shipping interests and motor trucking concerns.

It is significant that one of the most aggressive of the American firms operating in China has found it desirable to appoint as exclusive distributors two Chinese firms—one to cover Central and North China, and a second to cover the South China field.

In prewar days it was not unusual to find a foreign firm in some lines acting as importer, distributor, wholesaler and even retailer. The automotive trade was such a one. This setup is today breaking off into natural separate entities with many of the latter being taken on by Chinese firms. Chinese companies have been given exclusive import agencies; others have been given important distributorships, still others, wholesale and retail dealerships.

Specialization or concentration in fields in which Chinese firms are not yet in a position to enter, offer the most attractive possibilities for foreign firms in the future. And were it not for the abnormal postwar conditions of the abolition of extrality, imposition of foreign exchange and trade controls, UNRRA-CNRRA, Lend Lease and War Surplus disposal policies, inadequate transportation, and slowness towards achieving political unity, this new Chinese competition would take its place without too much upheaval for established foreign firms, as the field of opportunity would be less hampered. But some of these hampering conditions may be expected to work themselves off. The CNRRA-UNRRA procurement programs were slated to stop March 31, though supplies in shipment will still have to be disposed of in China. This disposal of the Pacific surplus supplies under the terms of the agreement is to be completed by June, 1948.

China's postwar reconstruction plans have been thwarted by internal strife in North China and Manchuria. The gigantic task of "taking over" physical properties of Japanese and German enemy nationals and of "puppets," of inventorying these properties; creating policies and procedural and disposal machinery, has been of a magnitude little appreciated by the average person. Exact figures have not been made public, but there were some 3000 industrial properties alone to handle, in China, Manchuria and Taiwan. There have been many accusations of mismanagement. Undoubtedly the task could have been done better. But the striking fact is that practically no one foresaw or planned for this eventuality, as it was generally believed that the Japanese would have to be blasted inch by inch out of China before they would surrender, and that there would be nothing of plant equipment left to take over. China ended the war with these unexpected industries on her hands, many damaged or deterioriated. They represented "spot reparations." Neither Chinese nor non-enemies had created these enterprises. They were regarded as national assets. The Chinese Government has publicly stated that it has three alternatives; (1) to sell them to merchants; (2) to lease them out; or (3) put them under government management. In practice the Chinese Government has pursued all three of these methods in its endeavor to cope with the problem. Recent instructions by Generalissimo Chiang Kai-shek, are to hasten the public sale of these properties.

Yet, while postwar reconstruction plans have been held in abeyance during this turmoil, preparation has not entirely stopped. Scores of American experts have within the last year gone to China at the invitation of the Chinese Government and made surveys of harbors, railways, highways, waterways, coal and other industrial enterprises, with the result that there is now in the possession of the Chinese government competent technical surveys upon which to solidly base postwar reconstruction. This is basic progress, as without such practical technical surveys, previous planning had been predicated largely upon theory and guesswork.

While appreciative of the assistance which the American government has rendered to China as a nation, government operations are too remote to the liking of the Chinese industrialist. Chinese business men want to pool their resources with American private enterprise and develop both industries and trade in China. They are searching for ways and means of effecting these contacts with American private enterprise. Chinese private enterprise is as rugged and individualistic as our own. They deplore government ownership. They feel that if American private enterprise will cooperate with them financially and technically they can build up a bulwark of private enterprise in China that will curb government enterprise incursions. But certain it is that in an undeveloped country such as China, unless private interests go forward fearlessly to develop opportunities that exist, government will move increasingly into different fields to see that development is undertaken. The job in China is so immense as to offer a wide field of opportunity for different interests.

Chinese business interests chafe over our inability to fill their orders on time; over the losses which they incur due to non-delivery because of our shipping strikes; of the complications which arise for them in opening and extending letters of credit under existing foreign exchange controls; over inability of our traders sometimes to secure American export licenses; when in some instances Chinese buyers have been given to understand that no difficulty will be experienced in securing export licenses.

Infinite patience is needed on our part as well as on that of the Chinese during these difficult days of transition from the aftermath of world war to peacetime conditions. And above all, we must keep a clear perspective and not allow sensational headlines to color or distort our views on China as a whole.

Harbor at Hong Kong

Export of Work Boats

The river tow boat, Troco No. 3, is one of seven craft, all identical in design, that were built by the Barbour Metal Boat Works, St. Louis, Missouri, for service in Colombia, South America. All of these 50′ x 14′ General Motors diesel powered vessels owned by the Tropical Oil Company are now engaged in cargo hauling work on the Magdalena River, the principal inland waterway of the country. Supplies are carried from Barranquilla, a seaport at the mouth of the Magdalena, upstream to the company's refineries. Here, they drop the supply cargo and take on barges of refined gasoline proceeding upstream to a river terminal several hundred miles from the sea, beyond which the river is not navigable. At this point, the cargoes of refined petroleum are transferred to trucks and thence hauled to local markets in Bogota, the capital city. Most of the production of the Tropical Oil Company is absorbed by Colombian consumers.

Although the climate is tropical and the country is generally subject to periods of heavy rainfall, certain areas in the Magdalena Valley experience long dry seasons which has its effect on river depths. For this reason, the boats are limited to a 3-foot draft, enabling them to navigate the year around, whereas larger boats are tied up periodically because of shallow water.

Workboats for export trade.

Pacific
WORLD
TRADE

Each boat is powered by a 170 hp General Motors Diesel Series 71 diesel engine that turns a specially designed 36″ x 30″ propeller through a 3:1 reduction gear. Blade areas are greater than standard propellers of equal size.

Normally, one boat tows two barges of 3′ 6″ draft with each having a capacity of 200 tons of cargo. Accommodations for a crew of eight have been provided.

At present, the Barbour Metal Boat Works is building two more of these craft for shipment to another owner and operator on the Magdalena River. They too will be powered by General Motors 6-cylinder diesel engines.

World-Wide Showing of S. F. Ship Arrivals

Arrival in San Francisco of two of American President Lines' Transpacific passenger-freighter ships, the President McKinley and the President Pierce, are highlighted in a motion picture now being made by the United States State Department for distribution in approximately thirty foreign countries.

The State Department film is one of several which will be made by the Office of International Relations and Culture Affairs to portray the American way of life to people of other nations.

The recent arrival of the President McKinley was filmed when the group of Hollywood photographers working on the picture boarded the vessel six miles off the Golden Gate. Movie shots were taken as the ship proceeded into the harbor and to its berth at Pier 42.

A few days later, when the President Pierce, inbound from the Orient, was anchored at the quarantine station off the Marina, the movie men—standing off a distance from the Pierce is a small boat—photographed the U. S. Public Health doctor as he climed a Jacob's ladder to board the vessel. When the ship was "cleared" by the doctor, the "hauling down" of the quarantine flag also was filmed, as was the boarding by Immigration and Custom officials.

Intended to show the international aspects of shipping and trade, other scenes in the movie, narration for which will be translated into twenty-six foreign languages, include numerous shots of cargo operations on the McKinley and Pierce and other American President Lines' ships in and about the Company's piers. Street scenes, the Bay bridges, Mission Dolores, the Presidio and many other San Francisco views are included in the picture.

Producer and writer of the film is Wallace Bosco of Fairfax Productions in Hollywood. Ricardo Cortez, veteran movie star, is the Director.

SAN FRANCISCO'S NATIONAL MARITIME DAY PLANS

Lewis A. Lapham, American-Hawaiian Steamship Company; general chairman on National Maritime Day Observance in San Francisco

The San Francisco Propeller Club sponsored observance of National Maritime Day, May 22, is officially under way with what promises to be an event-packed celebration that will long be remembered on the West Coast.

An impressive general committee headed by the American-Hawaiian Steamship Company's Lewis A. Lapham in the capacity of chairman, includes such marine industry figures as W. Miller Laughton, president of the San Francisco Propeller Club, A. W. Gatov, executive director, Pacific American Steamship Association, D. N. Lillevand, Waterfront Employers Association and a host of others.

Tentative plans drawn up by the committee include the following special events:

1. A parade of yachts through the Golden Gate.
2. A Marine Industry Exhibit, in which the industry is invited to participate.
3. Breakfast on Nob Hill (radio program).
4. Honoring first American merchant ship that enters San Francisco harbor May 22.
5. Memorial ceremony in memory of seamen lost at sea.
6. A colorful parade down Market Street; complete with floats, bands and marching units.
7. The regular annual Maritime Day luncheon at the San Francisco Commercial Club. Admiral W. W. Smith, chairman, U. S. Maritime Commission honored guest speaker.
8. Annual spring frolic of the Mariners Club of California at the Palace Hotel.
9. Presentation of the "Queen of Maritime Day".
10. Open house and dance for merchant seamen at the United Seamen's Service center, 439 Market Street.

GENERAL COMMITTEE

Chairman, Lewis A. Lapham, American-Hawaiian Steamship Co.

Vice Chairman, A. W. Gatov, Pacific American Steamship Association.

Frank DiMarco, Managing Director

D. N. Lillevand, Waterfront Employers Association

Hugh Gallagher, Pacific American Steamship Association

Robert H. Parsons, S. F. Junior Chamber of Commerce

Fred Galbreath, Foreign Trade Association, S. F. Chamber of Commerce

Mrs. Harry W. Parsons, Women's Organization for the American Merchant Marine

Fletcher Monson, Mariners Club of California

E. H. Harms, Marine Exchange

Don Fazackerley, United Seamen's Service

Leslie Houdlett, Commercial Club.

ADVISORY COMMITTEE

Chairman, Eugene F. Hoffman, American President Lines

Captain Henry Blackstone, Marine Office of America

Commander John Kucin, USMS, U. S. Merchant Marine Cadet School

M. A. Cremer, The Marine Exchange

R. DeGorog, Matson Navigation Co.

James B. Black, Jr., S. F. Junior Chamber of Commerce

Joseph Delsol, S. F. Junior Chamber of Commerce

R. E. Mayer, Pacific American Steamship Association

Captain Malcolm E. Crossman, USMS, U. S. Maritime Service

Captain Claude B. Mayo, USN (Ret.), Supt., California State Maritime Academy

Alex Kren, United Seamen's Service

Dick Glissman, Mariners Club of California

L. C. Fleming, U. S. Maritime Commission.

SPEAKERS' TABLE—Left to Right: Harvey T. Hill, executive director, Diesel Engine Mfrs. Assn.; Robert M. Pearson, sales manager, National Supply Company; A. M. Hyer, president, Hyer Towing Company, Pensacola, Fla.; Roland W. Bayerlein, manager, Heavy Machinery Division, Nordberg Manufacturing Company; G. L. Breece, chief engineer, McWilliams Dredging Co., New Orleans, La.; Robert H. Morse, Jr., vice president & gen. sales manager, Fairbanks, Morse & Co.; G. O. Huet, chief engineer, Higgins, Inc., New Orleans, La.; E. J. Schwanhausser, vice president, Worthington Pump & Mchry. Corp., presiding.

DIESEL CONFERENCE AT NEW ORLEANS

The diesel conference at New Orleans on March 20, differed from the session at San Francisco last November in that an important part of the program consisted of a recital of experience by users rather than explanatory talks by builders. From such a mixed program constructive benefits to the entire industry are sure to come.

SPEAKERS' TABLE CONTINUED—Left to Right: H. B. Dyer, president, Nashville Bridge Co., Nashville, Tenn.; Robert E. Friend, president, Nordberg Manufacturing Co.; R. P. Nolan, president, Algiers Public Service Co., New Orleans; Charles M. Reagle, vice president, Cooper-Bessemer Corp., N. Y.; George Brink, Moran Towing Company, New Orleans, La.; Addison F. Vars, president, Sterling Engine Company.

Marine Insurance

Our London Letter

By Our United Kingdom Correspondent

World Marine Insurance

ONE OF ENGLAND'S LEADING MARINE INSURANCE UNDERWRITERS, Harold H. Mummery, underwriter and manager of the marine department of The London Assurance, and chairman of the Institute of London Underwriters, has given members of the Insurance Institute of London a valuable review of the marine market in the transition from war to peace. Since hostilities in Europe terminated, Mr. Mummery said, hull rates had been reduced in some cases quite materially, while cargo rates today, generally speaking, did not bear comparison with the higher rates ruling 20 months ago. Again, war premiums were now down to a level when, understandably, they represented little more than a token payment. Since the end of the war a good deal of clearing up had been necessary in connection with outstanding claims—particularly those which the claimants were not able to submit to underwriters owing to the occupation of their territory by the enemy. Many of those claims had now been settled, but underwriters could still look forward to receiving further demands as and when the claimants were able to complete their documentary evidence proving the loss sustained.

All those interested in the complicated business of marine insurance, Mr. Mummery continued, were aware that during the period of the war an arrangement was concluded between the American Hull Syndicate and the War Shipping Administration, which became known as the Wartime Hull Agreement. That agreement covered certain merchant vessels taken under charter by the War Shipping Administration, and it was true to say that the agreement comprised the major part of the American mercantile fleet. While it could not be said officially that the agreement, as such, had now terminated, it could be said that the insurance with respect to any particular vessel terminated with the charter, and now almost all the vessels so chartered had been returned to their owners. Consequently there was only a small remnant of the liability assumed under the agreement which was still in force, and presumably even that remnant would come to an end before very long.

A 20 per cent share of the vessels insured under that Wartime Hull Agreement, Mr. Mummery explained, was placed in the London market in reinsurance of the American syndicate. One of the main provisions of the agreement was that the overall profit to the inferested underwriters should not exceed a matter of 7 per cent. The fact that the majority of the chartered vessels had now been returned to their owners and were once again insured in the free market had led to a great deal of competition between the American market and the British market, and Mr. Mummery said he ventured to think that the rates which had been quoted on this side could but result in an underwriting loss, having in mind the very considerable increase in the cost of material and labour in America, an increase which, he felt, had not yet reached its peak. Always over the heads of underwriters—American and British—there was the constant fear of inflation and what its reprecussions might be in the cost of claims. Only time would tell, but he was afraid another two or three years must elapse before a really true picture could be obtained of what the underwriting figures were likely to be.

Revision

An important revision of the Joint Hull Understanding has been announced by the Joint Hull Committee. The outstanding features are that, where a risk has shown good results over the last three complete years, the renewal rate may be reduced by 5 per cent; and that the formula is now subdivided into two sections, one for ownerships whose combined value is under £3,000,000, and one for ownerships whose combined values is £3,000,000 or more.

In the first catagory, where the credit balance of premiums over claims for the last three completed years, including all outstanding liabilities, is 50 per cent, or more, the rate on renewal may be reduced by 5 per cent. Where the credit balance is under 50 per cent but not below 40 per cent, neither reduction nor increase in rate is required, while where the credit balance is less than 40 per cent an increase in rate according to the customary "sliding scale" is required.

In the second catagory, the credit balance of premiums over claims for the last three completed years which will permit a reduction of 5 per cent in the renewal premium is 45 per cent. No reduction or increase is required where the credit balance is below 45 per cent but not below 35 per cent, and where the credit balance is below 35 per cent, the sliding scale formula applies to the minimum increase in premium to be required on renewal.

Reversion to 1939 Rates?

A. H. Nimmo, chairman of the Association of Underwriters and Insurance Brokers in Glasgow, made some interesting and controversial points at the 129th annual meeting of the Association. Dealing with hull business he advanced theories which leading London underwriters considered revolutionary. He advocated the wiping out of all increases in rates, and a reversion to 1939 rates, plus an all-round increase to be fixed as required. He suggested that "on record" increases should be left to individual underwriters until the "Institute" (presumably the Joint Hull Committee) could assess results on at least two postwar years. "Empire" and new ships should be rated uniformly, not diversely according to the formula based on rates paid on other vessels in the same fleet. The present system of rating increases in value at one-half the "All Risks" rate, plus one-half the "total loss" rate, should be abandoned. If only the "total loss" rate was paid on the increased amount, owners would be encouraged to replace war losses.

It is to be feared that not one of the suggestions made by Mr. Nimmo is likely to prove acceptable to the London market. It is pointed out by a leading underwriter that the reductions in rates resulting from the amendments to the "Understanding" in 1945 do represent the level of rating of 1939, plus a loading to offset increased repair costs and other increased charges. To abandon the "sliding scale" formula for increasing rates where risks have not good records would be to scrap a system which has proved its worth and to invite that over-keen competition for "the lead" which has proved fatal to the market on every occasion in the past when the "Understanding" has broken down. The suggestion that "Empire" and newly acquired ships should be rated uniformly is very difficult to understand. Its acceptance would mean that the good owner and the bad owner, from an underwriting point of view, would pay the same rate on an "Empire" or new ship, which would be most unfair to the good owner and give the bad owner an unwarranted advantage.

It is a commonplace of marine underwriting that identical vessels in different ownership will be rated diversely because the claims records of the owners are diverse. As for the suggestion that increases in value should be rated by adding to the basic premium the total loss premium on the amount of the increase, this disregards entirely the fact that, while an increase in value improves the particular average risk in a minor degree, it increases the liabilities for general average, salvage, and damage done in collision. The present formula of one-half the "all risks" rate, plus one-half the "total loss" rate on the amount by which a value is increased, has proved satisfactory in practice, and to abandon it, particularly for the formula suggested by Mr. Nimmo, would be to invite disaster.

Paint Risk

An account of the progress so far achieved in regard to research into the ways of reducing the fire risk of paints and other materials used in ships is included in the development programme of the Admiralty Chemical Department at Portsmouth. Regarding fire-retarding paints for interior use on board ship, the account states that experience obtained during the war showed that fire could be propagated from one compartment to another by means of the paint film on the bulkhead between them. When raised to a sufficient high temperature the paint—on the side of the bulkhead remote from the actual conflagration—first blisters, and pockets of inflammable vapours are formed. These vapours arise from the partial decomposition of the organic paint. medium in the interior of the paint layer. The blisters finally burst omitting jets of hot gas which ignite spontaneously and burn vigorously, transmitting the fire to any combustible material within reach.

Since the inflammable component of a paint film is the medium, consisting of dried linseed oil and perhaps resins, it is obvious that the first step in the formulation of a fire-retardant paint is to reduce the proportion of the medium as far as is consistent with durability and "finish." This is not the whole story, however. The nature of the primer used beneath the final topcoat is found to be of vital importance. The usual red-lead linseed oil primer has poor fire-resistant properties, but after considerable experiment it has been shown that a primer pigmented with metallic aluminum powder in "leaf" form is very effective. The efficiency of this primer may be ascribed in part to its ability to form a very thin film, but mainly to the good thermal conductivity of aluminum which ensures an even heating of the whole film with the avoidance or minimisation of localised heating effects which favour the formation of blisters.

War Risk in Future Wars

The International Marine Insurance Union has received a letter from the Nordic Marine Insurance Pool (the Pool comprises all the marine insurance companies in Denmark, Finland, Norway and Sweden) suggesting that insurance against war risks arising out of any future major war should not be undertaken by underwriters in any country, either as direct business or reinsurance. It is pointed out that the destruction following upon the outbreak of a future war would be so great that no underwriter or insurance company, irrespective of their financial standing, could be certain of being able to meet the liabilities incurred. It is even suggested that the devastation of a future war might be so great that Governments might not be able to give full indemnification against war losses to their subjects. Another argument put forward is that if banks, merchants, manufacturers and financial houses knew that no insurance against war risks was possible, they would use their influence to prevent a future war, and that if it was brought home to the general public that complete indemnification against war losses was not possible, the forces opposed to war would be greatly strengthened.

In the English market, there are three principal out-

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Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

Maritime Rights in a State Court

ORDINARILY WE THINK OF ANY ACTION involving a vessel as one that lies within the jurisdiction of the Federal Courts. Although a great majority of actions involving vessels are instituted and tried in the Federal Courts, there are many actions that may be appropriately determined by State Courts with or without a jury. An interesting case, entitled *Crofton et al. v. Pappas et al.,* deals in part with the question whether plaintiff is entitled to a writ of attachment against a vessel owned by the defendant where the defense is raised that, because of the maritime lien which plaintiff already enjoys, he is estopped from obtaining a writ of attachment, because, under the laws of California, one must, by affidavit, prove that no other security is available before a writ of attachment is permitted.

Another objection to the writ is based upon the claim that this was an attempt to bring an action in rem (an action against the thing itself—in this case, the boat). If that was true, of course, plaintiff's complaint would be dismissed on the ground that he was attempting to foreclose a maritime lien in a State Court, which is, of course, not permitted, but would be an action that only lies within the jurisdiction of the Federal Courts.

However, other courts have considered this problem and have provided a distinction between the cases that are in fact personal actions, even though a concurrent attachment is levied upon a vessel in the same action. The defendants have, in effect, asked the court for a finding that the attachment proceeding is void. The court was fortunate in having prior California cases upon which to rely, in which the courts have stated that the maritime lien provided under the California statute is not of such fixed and determinate character as to take from the plaintiff in an action such as this the right to a writ of attachment against the property of the defendant, whether or not the property attached be the vessel on which repairs were made. The court characterized the maritime lien as a "floating right". California courts have steadfastly maintained that the lien was not intended to be exclusive of all remedies afforded for the enforcement of payment for labor performed and materials furnished in the repair of vessels, because in this case plaintiff had a right to action independent of this special statute, and therefore was not barred from availing himself of the general law relating to attachments on the assumption that the debt was "secured by mortgage or lien upon real or personal property, or pledge of personal property."

The Court affirmed the judgment and permitted the writ of attachment against the vessel to stand as a valid undertaking.

Third Party versus Manufacturer of Defective Block

If a third party attempt to recover against the manufacturer of a defective piece of machinery or equipment twenty years ago, he would have been unsuccessful in his suit and his claim would have been denied. The principle of *MacPherson vs. Buick* led the way in changing the rule so that a third party might recover from a manufacturer where the manufacturer produced a defective piece of machinery or equipment without showing any privity of contract. The Court in that case and in many succeeding cases has held that the manufacturer must foresee the uses to which certain machinery or equipment will be put after it has been placed in use and, therefore, he owes a direct responsibility to safeguard the person and property of a person who may subsequently use it insofar as insuring the proper manufacture of the equipment or machinery in the first place. The case has been extended to food and many other items and in a celebrated Supreme Court case entitled *Sieracki vs. Seas Shipping Company,* which case was reviewed in this column some time ago, the court held the manufacturer of a defective piece of ship's equipment directly liable to a seaman who was injured as a result of using the equipment. The Court held that it was a maritime tort.

In the very recent case decided in the United States District Court of Maine, entitled *Todd Shipyards Corporation vs United States of America and Steel Products Company* 1947 A.M.C. 204, the libelant, a shipyard company, seeks to recover for damage to its property caused by the failure of a boom block alleged to be due to negligence in its construction by the manufacturer, respondent Steel Products Company. The block was not purchased of that company by the libelant, but was furnished by the Navy Department for which the libelant was repairing a vessel when the block broke, according to the allegations in the libel. The Steel Products Company filed what amounts to a motion to dismiss upon the basis that the action was for a breach of warranty. The Court held that the action was not one for a breach of warranty but, to the contrary, was one for a maritime tort.

The substantial question raised by the motion to dismiss is simply whether the libelant, who has suffered injury to its property, must be denied the right to recover

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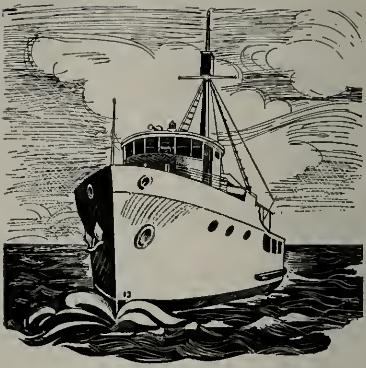
Coast COMMERCIAL CRAFT



NAVY'S A. O. G.'S POWERED WITH CLEVELAND DIESELS

DURING THE WAR a fleet of 23 twin-screw tankers was built to the order of the Navy Department at shipyards of Seattle-Tacoma Shipbuilding Company, Tacoma, Washington, and Cargill, Inc., Savage, Minnesota, for gasoline and lube oil transportation in the Pacific. These ships are high-powered for their size, have good turn of speed, 14½ knots to be exact, and are equipped with considerably more propulsion and auxiliary power than is customary with tankers of their tonnage. Thirteen of them are still in active naval service; and the remainder may be sold, some to Bolivia and other countries, some transferred to the U. S. Army, and some to private tankshipping companies.

A. O. G. means Auxiliary Oil and Gasoline vessel. All

One of a fleet of 23 A. O. G.-type Navy oil tankers powered by diesel engines made by the Cleveland Diesel Engine Division of General Motors. Most of these tankers have four 16-cylinder engines totaling 6400 aggregate brake horsepower.

23 of these A.O.G.'s use General Motors Cleveland diesel engines for power. Most of them have four 16-cylinder units of 6400 aggregate brake horsepower at the maker's normal rating, but at 5920 maximum hp and 3960 normal horsepower according to the Navy's rating for this service.

Some tankers of the A.O.G. class have two 16 cylinder engines of 1600 bhp each, and others have two 8 cylinder engines of 800 bhp, installed for auxiliary purposes. Each vessel has a single-cylinder auxiliary unit as well. All engines are of the two-cycle type.

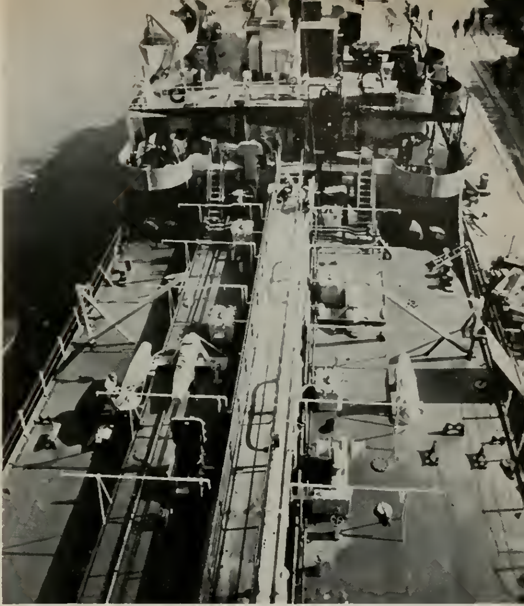
These tankers are beautifully proportioned, and in appearance resemble the latest large ocean-going tankers with raked bow and a squat large-diameter stack. They have a single well forward and a catwalk aft of the bridge-house. Following are their dimensions and other particulars:

Displacement, loaded (average)	4,160 tons
Displacement, light	1,744 tons
Cargo capacity, net	1,960 tons
Length, o. a.	310′ 9″
Length, b. p.	292′ 0″
Breadth	48′ 3″
Draft, loaded	15′ fwd & 16′ aft
Draft, light	6′ fwd & 9′ 2″ aft
Depth, m. d.	19′ 9″
Speed, loaded	14½ knots
Fuel capacity	355 tons
Cruising radius	6,000 nautical miles

Each of the four main General Motors diesels drives a 775 kw General Electric generator at 675 rpm, and these units furnish direct current for two pairs of propulsion motors, each pair being geared to one of the twin propeller shafts. Each electric motor develops 960 shp. The four-bladed propellers are of 8.75′ diameter by 7.875′ pitch.

The tank cargo space is designed to carry lubricating oil and gasoline or other petroleum derivitives with no possibility of contamination of lube oil by the other cargo. Two lube oil tanks forward are completely surrounded by coffer dam and a separate pump room and piping system installed for discharging this cargo. This room is equipped with two electric motor drive centrifugal pumps with a capacity of 2100 gph. The cargo capacity in lube oil is 4400 gallons. Cargo capacity for gasoline or diesel oil is 660,000 gallons and this is handled by two electric motor drive centrifugal pumps located in a pump room aft, and having a capacity of 72,000 gph.

Accommodation is provided for 118 officers and men, including gun crews. Food storage, refrigeration, fresh water, heating and ventilating and stores are on a more extensive scale than is required in commercial tankers.


View looking aft from the bridge of one of the fleet of 23 A. O. G.-type Navy oil tankers powered by General Motors diesel engines.

Eight of these engines (as installed in each of seven submarine tenders) would provide about as much power as is fitted currently in the most powerful American-flag steam turbine tanker. At full load, the 12,800 hp Cleveland diesel propulsion units, plus the power of a small auxiliary engine at sea, only consume about 45 tons per 24-hour day. This is considerably less than the 74 tons required at top speed by the Cimarron class of tankship that was built shortly before the war by the American oil industry in collaboration with the Navy Department and the Maritime Commission. This means that on a 12-day, full-power voyage of a large motor tanker the total saving in fuel consumption would be 348 tons, or 696 tons on a round trip, without including the saving due to the lower fuel consumption of diesel engines.

G. M. Twin Screw Tugboat Alameda Operating on San Francisco Bay

Built for the Harbor Tug and Barge Company, the tugboat Alameda was recently commissioned and is now in service on San Francisco Bay.

This boat was originally built in Sacramento in 1946 and was brought down to the Pacific Drydock and Repair Company for outfitting. This is a twin screw tug with a General Motors 1271 (or twin) on each screw, or a total of 24 cylinders in all for main propulsion. This is the first application of this type propulsion in the San

Harbor Tug and Barge Company's tugboat, Alameda.

Francisco Bay area, and the power aboard belies the boat's size, for it is only 54.6 in length, 16.7 in beam, draws 6′ of water; her gross tonnage is 39.79 tons and net tonnage is 13 tons. For a boat of this size to be powered with 600 hp engines is quite an unusual feat. It is questionable whether any engine except this particular combination of G. M. 2-cycle engines could be carried on this size of tug.

There are several boats in the Bay that have the G. M. 71 series twin engine for main propulsion, but this is the first twin screw job, and it is also outstanding inasmuch as this particular pair of engines is equipped with new G. M. marine gear.

This gear is a recent development of the corporation, and it has resulted in a saving in length of the engine of over 13 inches and 360 lbs. less in weight, with a very simplified method of control. The clutch is a friction type clutch but is actuated by oil pressure in place of a lot of complicated mechanical toggle action, which in direct drive couples the engine directly to the output pinion of the reduction gear. In reverse, the clutch couples the engine to the output pinion by way of the planetary reversing gears.

Being hydraulically operated, this gear may be controlled by simple means from several locations around the boat, and although on this particular installation controls were not installed on the after deck, it has been very common practice in tugboat work to do so.

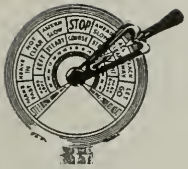
The electrical work, including all the wiring, has been done by Ets-Hokin-Galvan Company of San Francisco, who have also installed one of their new 25 watt radio telephones. The propellers were the Doran Type D, and with this engine's horsepower have resulted in a speed free and away of over 12 knots. The towing machine was designed and made by the Pacific Drydock and Repair Company and is driven by means of line shafting from a clutch on the forward end of one of the engines.

BRINGING A BOAT TO WATER

The 38-foot diesel powered trawler Little Tom is referred to along the Florida coast as "one of the boats built in the woods." Billinger and Son of Jacksonville, Florida, builders of the Little Tom, as well as other small craft for the fishing industry, operate their shipyard five miles from any water. The finished vessels have to be transported over highways to the St. Johns River for launching. The Little Tom is shown being towed on dollies to the river where a giant crane prepares to lower her into the water. Power for all steel shrimp trawler is supplied by a 113 hp General Motors diesel engine. The Joe and Tom Smirch Shrimp Company of Mayport, Florida, are the owners.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

Bringing Radar to the Deck Officers

STANDARD OF CALIFORNIA is installing radar on its sea-going fleet, and is making the installations on San Francisco Bay. The instrument is the Mariner's Pathfinder, manufactured by Submarine Signal Co., and installed by Mackay Radio & Telegraph Co.

A very large percentage of the questions asked by deck officers today have to do with radar. Therefore the Standard tanker, R. G. Follis, on which a trial run was charted, is traced in and out of the Golden Gate on the following pages, and brief instructions for operating the instruments are given herewith.

The radar sets designed specifically for maritime service consist of three parts—a rotating antenna on top a mast, a transmitter-receiver housed in the chartroom and a viewing console on which the radar picture is presented in the wheelhouse. The rotating antenna sends out high-frequency waves to locate objects which might be in the vicinity of the ship. These waves travel through the air at the speed of light and are capable of penetrating any atmospheric condition, including thick fog.

When the waves strike an object, they bounce off and some return to the rotating antenna, which acts as a receiver in the intervals between the outgoing pulses. After being amplified, the returning waves, or echoes, appear as bright spots on the face of a cathode ray tube similar to a television screen tube. The image thus formed gives the operator a radar picture of all objects in the vicinity.

The distance between the vessel and these objects is

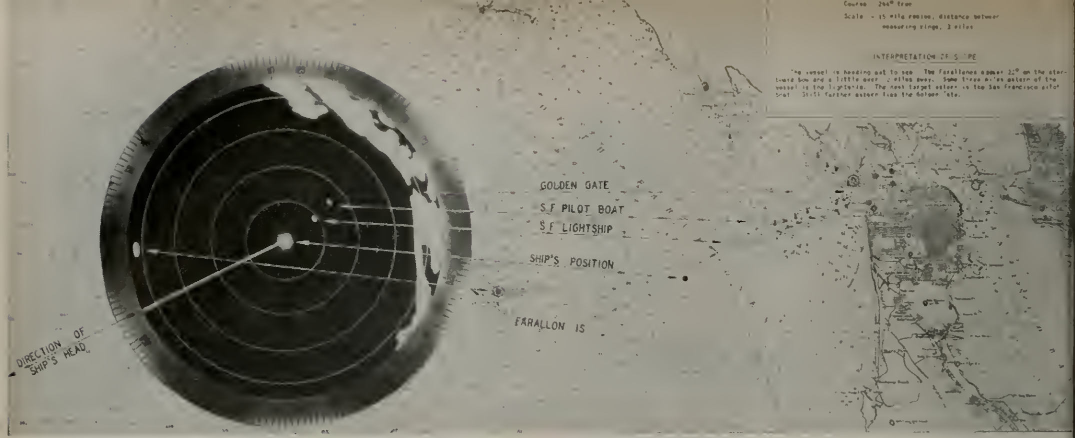
(Continuation of story on page 142—see Radar Charts an pages 90 and 91)

Three Basic Units of Ship Radar

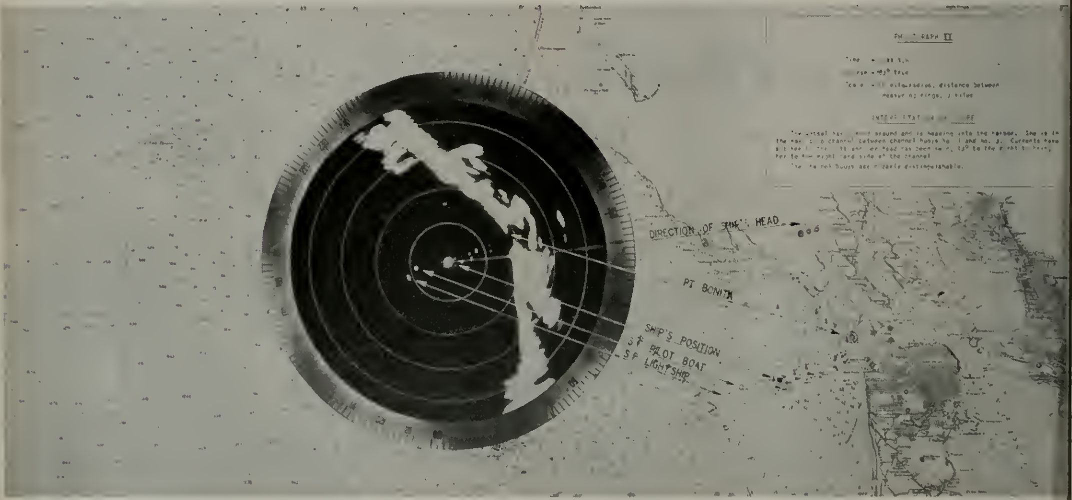
Close-up of radar antenna.

Viewing scope installed in wheelhouse.

Transmitter-receiver installed in corner of chart room

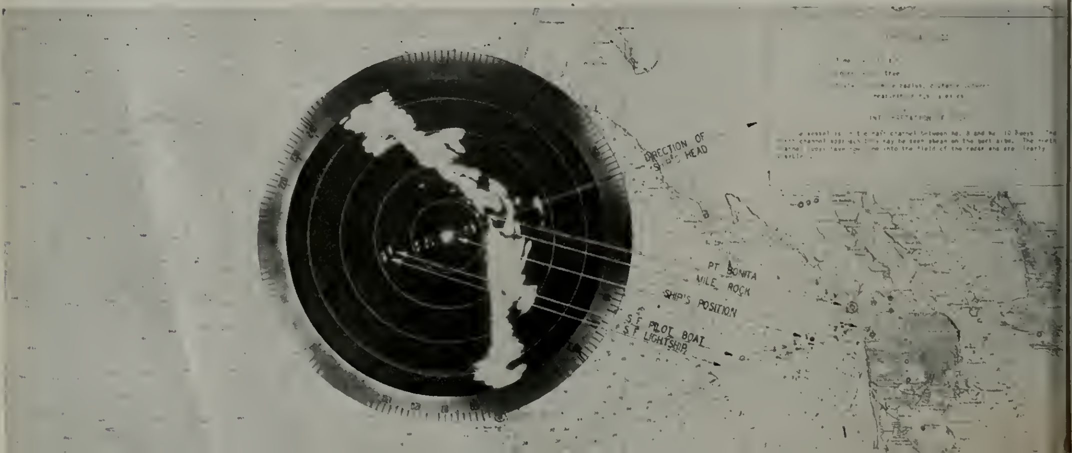


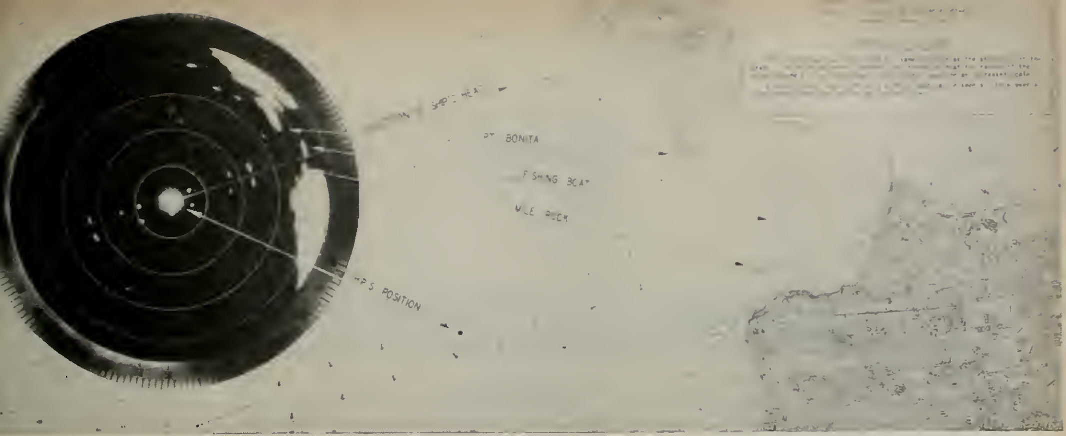
Course, 244° true. The vessel is heading out to sea. The Farallones appear 22° on the starboard bow and a little over 12 miles away. Some three miles astern of the vessel is the lightship. The next target is the San Francisco pilot boat. Further astern lies the Golden Gate.



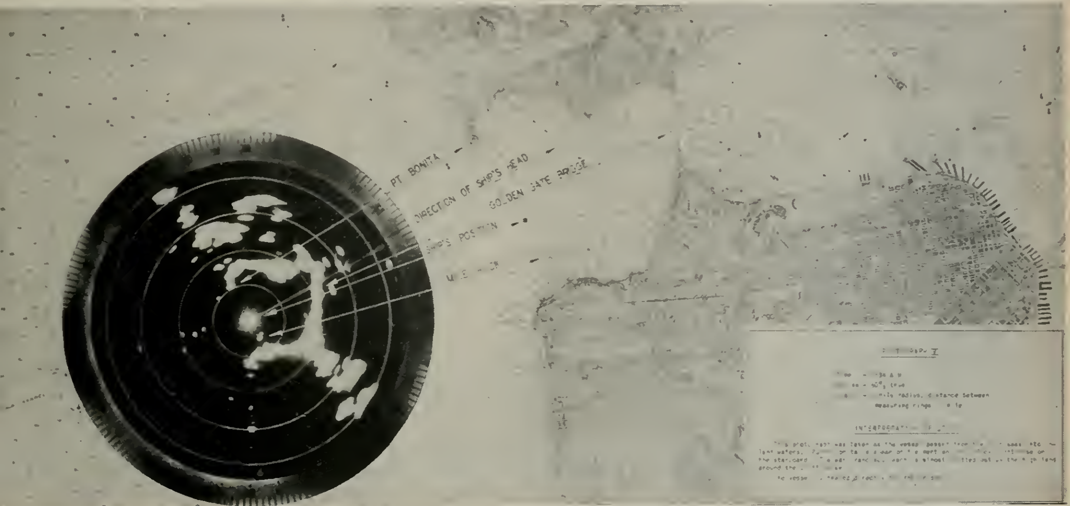
Course, 83° true. The vessel has turned and is heading into harbor. She is in the main ship channel between buoys No. 1 and No. 3. Currents have set her to the left and her head has been swung 13° to the right to bring her to the right side of the channel. The channel buoys are clearly distinguishable.

Course, 70° true. The vessel is in the main channel between No. 8 and No. 10 buoys. The north channel approach buoy may be seen abeam on the port side. North channel buoys have now come into the field of radar.



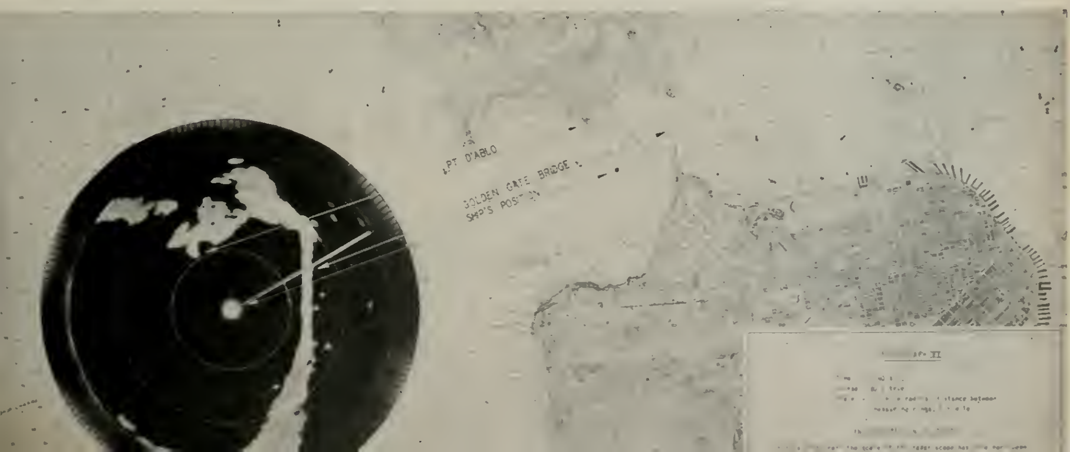


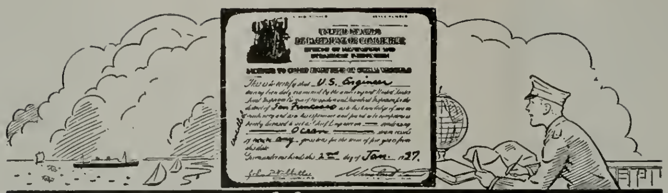
Course, 70° true. Taken from same position as preceding photograph. The range selector, however, was turned so that radius of the scope became 5 miles showing the channel buoys on increased scale. A fishing boat can be seen over 4 miles ahead about two degrees on the port side.



Course, 60½° true. Point Bonita is abeam on the port side and Mile Rock Lighthouse on starboard. San Francisco is almost blotted out by high land around Cliffhouse. Vessel headed directly for the bridge.

Course, 60½° true. Scale of radar scope has once more been changed. The radius now equals 1.5 miles and distance between measuring rings 0.5 mile. Point Diablo is abeam on portside and the bridge lies ahead a little over 0.5 mile away.





Your Problems Answered

by "The Chief"

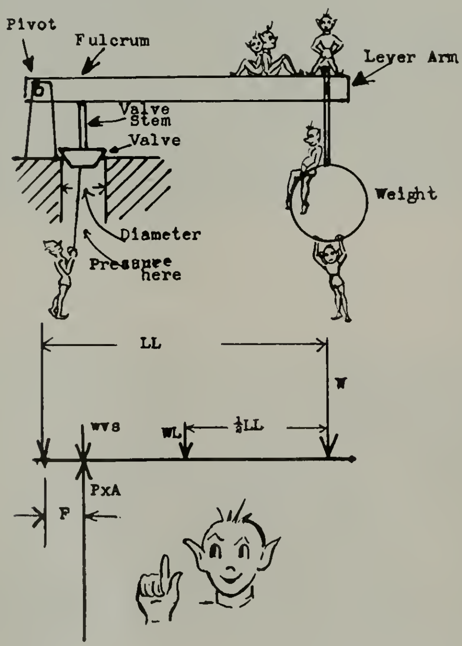
"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

THE PROFESSOR SAYS—

There is LOGIC behind the formulae in engineering.

Mathematics is pure logic highly organized into sections and expressed in a short-hand to simplify the work of writing the statements.

This is illustrated in the demonstration and proof of the SAFETY VALVE problem as follows. Every licensed engineer has at one time solved this problem because it is one of the legal requirements of the license. However he probably has worked it from a published formula without knowing the logic and reasoning behind the formula.



THE PROBLEM. Given the dimensions of the old fashioned safety valve of the lever type; to find the pressure or weight or some other unknown.

THE SOLUTION. (Engineers should always start a solution of a problem with a sketch of some kind if at all possible.)

The forces on the system are—

W = lbs. weight of ball hung on lever

P = pressure. lbs. per sq. in.

A = area in sq. ins.

$= 3.1416 \times \overline{\text{radius}}^{2}$

$= \frac{1}{4} \times 3.1416\ \overline{\text{diameter}}^{2}$

$= .7854 \times \overline{\text{diam.}}^{2}$

wvs = weight of valve and stem

WL = wt. of lever and balanced at ½ length of lever

A TORQUE is a twist expressed in lb. ft.

A MOMENT is a torque that does not result in motion but is usually balanced out. Both are measured in lb. ft. (Note: WORK is expressed in ft. lbs.)

F. length of fulcrum and LL that of lever both in same units either ft. or in.

Moments to move lever in clockwise (CW) rotation about the pivot are:

Fx wvs
½LL × WL
LL × W

Moments to rotate counter CW (CCW)

F × P x A

CW and CCW moments are equal because lever does not move even when it is just about ready to lift to release steam.

Making this same statement in the short-hand, we have:

$$F \times P \, x \, A \;=\; F \times wvs + \tfrac{1}{2} \, LL \times WL + LL \times W$$

Solve for W by transposing. To transpose, put term with W in it alone and on the left hand side of the equals mark. (Be careful of signs, plus and minus.) (+ is short-hand for plus or add.)

$$LL\,W = F\,P\,A - F\,wvs - \tfrac{1}{2}\,LL\,WL \quad (\text{— is short-hand for subtract.})$$

(Note: We omit the letter x as a sign of multiplication as it is not customary to use it. To place letters or numbers side by side indicates that they should be multiplied.)

Again transpose. If above the line on one side it may be put below the line on the other side.

$$W = \frac{F\,P\,A - F\,wvs - \tfrac{1}{2}\,LL\,WL}{LL}$$

The weights of valve, stem and lever are corrective elements in the solution. The algebra is simpler and easier to remember if these are grouped together and figured apart from the main problem. Let EM be "effective moment" and be, (F wvs + ½ LL WL). Note the sign changed from minus to plus when enclosed in parenthesis and having a minus sign in front of the group. Then:

$$EM = (F\,wvs + \tfrac{1}{2}\,LL\,WL) \qquad (1)$$

$$W = \frac{F\,P\,A - EM}{LL} \qquad (2)$$

To solve for LL we transpose "criss-cross" as follows:

$$LL = \frac{F\,P\,A - EM}{W} \qquad (3)$$

To solve for P start with,

$$LL\,W = F\,P\,A - EM \qquad \text{transposing,}$$

$$F\,P\,A = LL\,W + EM$$

$$P = \frac{LL\,W + EM}{F\,A} \qquad (4)$$

Or,

$$A = \frac{LL\,W + EM}{F\,P} \qquad (5)$$

And,

$$F = \frac{LL\,W + EM}{P\,A} \qquad (6)$$

The marine engineer usually memorizes formulae (1), (2) and (4). He then transposes to solve for (3), (5) and (6).

Some time we may be required to solve for Diameter. Use (5) for A and let D equal diameter.

$$A = .7854\,D^2$$

$$D^2 = \frac{A}{.7854} \quad \text{and,} \quad D = \sqrt{\frac{A}{.7854}}$$

LL, F, wvs or WL can be solved for by starting with the original formula at the top of this sheet. We must know the numerical value of all the symbols but one in order to find the value of that one.

"THE CHIEF."

On the Ways

New Construction - Reconditioning - Repairs

First Ship Launched in Saint Nazaire Since Liberation

An important event, marking the revival of the French shipyards and the reconstruction efforts of the French Merchant Marine, took place in Saint Nazarie on March 8, when the new motorship Washington was launched in these shipyards. This is the first ship to go down the ways since the Liberation of France. Jules Moch, Minister of Public Works and Transportation presided at the ceremony.

The ship, named Washington, is a diesel propelled freighter of 10,250 tons dw, which will be operated by the French Line in its North Pacific service between Antwerp, the Northern ports of France, and the Pacific ports of the United States and Canada. She has a freight capacity of 554,000 cubic feet, a large part, 120,700 cubic feet refrigerated.

The Washington, a motorship equipped with two diesel engines developing 12.000 hp, will have a speed of 17 knots. She will have accommodations for twelve passengers, and is the first of a series of three similar ships.

New French Line motorship Washington launched at St. Nazaire, France, March 8, for use in North Pacific service.

Del Sud on Trial Run Before Entering Cruise Service

The new passenger-cargo luxury liner Del Sud, second of a fleet of three liners being built by The Ingalls Shipbuilding Corporation at its Pascagoula, Miss., yard for the Mississippi Shipping Company's Delta Line, is shown on her recent trial run in the Gulf of Mexico.

The 17,000-ton ship, like her sister ship, the recently commissioned Del Norte, will sail on 47-day cruises from her home port of New Orleans to Buenos Aires and return, with stops at Santos, Rio, Martinique and Trinidad.

The Del Sud, an Ingalls Shipbuilding Company built passenger-cargo luxury liner, shown on her trials.

Old railroad car ferry, Ramon, undergoing annual drydocking and voyage repairs.

DRYDOCKING THE OLD RAILROAD CAR FERRY RAMON

An example of the skill and versatility required by ship repair yards in drydocking vessels of different sizes and underwater construction is seen at Bethlehem Steel Company's Alameda Repair Yard where the old railroad car ferry Ramon recently underwent annual drydocking and voyage repairs.

The Ramon, whose underwater body design is the only one of its type in existence, for the past 33 years has operated on Suisun Bay in ferrying freight and passenger railroad cars between Mallard and Chipps. It was built in 1914 by the Pacific Rolling Mills in San Francisco for what at that time was the Oakland, Antioch and Eastern Ry:. later to become the Sacramento Northern Ry. The vessel was erected and launched at Pittsburg, California.

Powered by a 600 hp, 8-cylinder Union Gasoline engine, the Ramon has an overall length of 230 feet and a beam of 56′ 8″. Its two propellers are connected by direct drive to the 8-cylinder engine. The vessel can carry nine freight cars and a locomotive on two railroad tracks which parallel each other in the center of the deck. Last year alone the Ramon made 3,239 one-way trips.

Because of its unique design, the Ramon evoked much comment and criticism among shipbuilders at the time. For a while it was called "Sam Napthaly's Dream," Mr. Napthaly being president of the railroad. They didn't believe, as he did, that a vessel of the Ramon type could be built so that when fully loaded its draft would be increased only 18″ to 24″. His "Dream" proved a reality. The Ramon was able to carry a maximum load of 700 tons with a maximum increase in draft of only 34″.

The box-like shape of the vessel's underwater body, however, created a problem in drydocking owing to the difference in height between the keel section and the underside of the hull. The keel section, which houses both the propulsion machinery and the propeller shafts, extending forward and aft, is attached to the underside of the hull. These shafts are supported by steel struts.

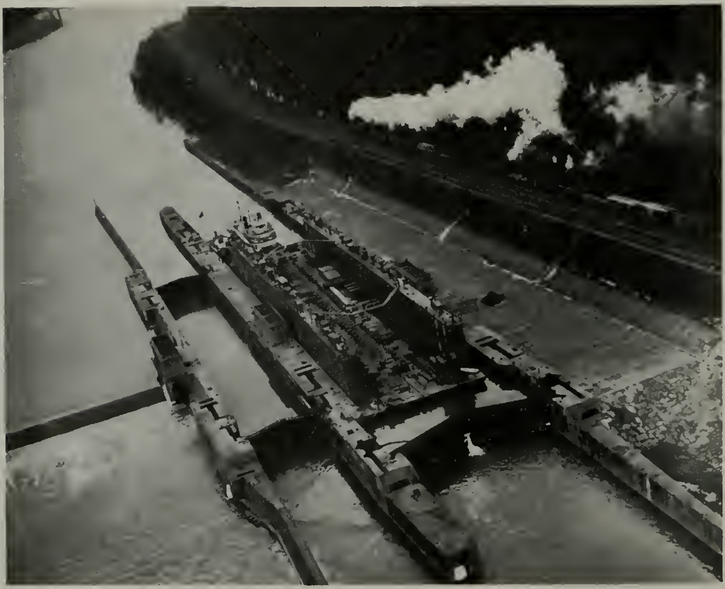
At first, when being drydocked, heavy timber blocking had to be erected and braced in order to support the vessel adequately and without strain. This took four days besides the time the ship was in drydock.

In order to reduce the time needed to prepare the drydock for the Ramon and also to increase the efficiency of the drydocking operation itself, engineers at the Alameda Yard redesigned the type of blocking to be used and constructed a series of timber braced cribs about 6′ 4″ wide and 16″ thick. These are secured to the tops of the bilge blocks and are tied together as a unit fore and aft and braced diagonally. Through the use of this specially designed cribbing, drydock preparation time was cut to eight hours.

Engineers redesigned the type of blocking to be used and constructed a series of timber-braced cribs about 6 ft. 4 inches wide and 16 inches thick. These are secured to the tops of the bilge blocks and are tied together as a unit fore and aft and braced diagonally.

Todd Reconditions City's Ferry Fleet

Ferry Boat Knickerbocker, one of the largest of New York's ferry boat fleet, in dry dock at Todd Shipyards Corporation's Hoboken division. The vessel, which is one of eight ferries to be drydocked and thoroughly overhauled during the coming months, will return to service within the next few days. The Knickerbocker has a passenger capacity of 2300. The other vessels to be reconditioned by Todd are: the American Legion, the Mayor Gaynor, the Dongan Hills, the Tompkinsville, the Miss New York, the Murray and the Gold Star Mother.



Navy Drydock On Long Tow

En route from Pittsburgh to the Gulf of Mexico, the AFDL-47, largest vessel ever launched on an inland river, is shown here as it was being maneuvered into the Dashields Locks in the Ohio River below Sewickley, Pa. Built by Dravo Corporation, the huge floating drydock had a clearance of six and one-half feet on either side as it passed through the lock.

Running Lights

Edited by B. H. BOYNTON

The Golden Bear, training ship of the California Maritime Academy, which just finished a voyage through the Panama Canal to the Caribbean. The vessel, the former USS Mellena, which took part in the attack on Okinawa and other Pacific naval engagements, carries 80 midshipmen under the command of Captain R. M. G. Swaney.

LIFE ON THE GOLDEN BEAR

The Golden Bear of the California Maritime Academy is home after the annual training cruise, this time to Caribbean waters. Ship and facilities have been covered previously in Pacific Marine Review, but in lieu of a brief article on this cruise we are going to print a report of the highlights of the trip written by one of the Cadets, Robert Kuykendall, to his father, S. L. "Roy" Kuykendall, president of Marine Marketing Co., of San Pedro, California.

Pop:—

Here are some of the matters of interest that developed on the cruise this year, if they are wanted for a story in P.M.R.

Watches were completely stood by the midshipmen, both in the engine room and on the bridge.

Midshipmen did all repair work aboard ship with supervision from officers when necessary.

Much practical experience was gained on high pressure ship by engineers. Much was learned about turbo-electric propulsion.

Liberties

Panama—Tours of old Panama given by Fort Amador USO.

Veracruz—Three day trip to Mexico City.

New Orleans—Four days of Mardi Gras, honored guests at Venus ball, basketball game with Pass Christian (Federal Maritime Acad.) dance given by United Seamans Service. Marched in Venus parade. Luncheon by Propeller Club.

Kingston, Jam.—Dinner dances given by prominent English families.

Midshipman R. Kuykendall overhauling valve chest on pump.

Deck midshipmen washing down superstructure deck.

Left to right: Midshipmen F. Uhrich and F. Meyer changing burners while underway.

▲ Top: Midshipmen off watch enjoying tropical sun.

Center, left to right: Midshipmen R. Otto, I. P. Williams and N. Wainwright relaxing after a day's turn to.

Bottom: Midshipmen cadets doing precision lathe work aboard the Golden Bear.

▲ Deck midshipmen painting hull in Magdalena Bay, Mexico.

▼ At top, left to right: Midshipmen A. Brune, J. Richardson, R. Fielder, W. Porterfield at noon mess.

At bottom: First class deck midshipmen plotting course in cadet's chart room.

Hagan Appointment

R. R. Donaldson, acting chief engineer of Hagan Corporation for several months since the retirement of T. A. Peebles, has been appointed chief engineer.

Donaldson started with Hagan in the field of combustion control of steam boilers immediately after he returned from the army in 1918 and has been an important member of its engineering staff ever since. He is a member of the ASME. He assisted in the development of new control mechanisms and their application to steel and other industries and was in large part responsible for adaptation of automatic combustion control to the marine field in 1935 and 1936. The latter gained considerable headway during World War II.

R. R. Donaldson, chief engineer, Hagan Corp.

Scenes at Recent Port Los Angeles - Long Beach Propeller Club Meeting

▼ Left to right: Allan Bullard, Admiralty Attorney; S. A. Hodges, Mackay Radio & Telegraph Co.; unidentified gentleman; Karl French, naval architect.

▼ Included in the gathering: James A. Keller, Pacific Coast Cement Institute; Lawrence Wolff, Union Oil Co.; James S. Spurch, General Electric Co.

▲ Left to right: D. M. Hodges, Foster Wheeler; James C. Craig, Craig Shipbuilding Co.; Harold A. Black, McCutchen, Thomas, Matthew, Griffiths and Greene; John C. McHose, Lillick, Geary & McHose; Reid R. Briggs, Lillick, Geary & McHose; William A. C. Roethke, Lillick, Geary & McHose.

▲ Left to right: H. K. Winterer, General Electric Co.; Roland L. Horne, U. S. Coast & Geodetic Survey; R. F. Jorgensen, Burns SS Co.; F. W. Fearman, Vancouver, B. C.; L. G. Burns, Burns SS Co.; A. E. Gram, Marine Exchange; Wm. H. Schroeder, Citizens National Bank.

Photos by Pacific Marine Review

Shoreside Personalities

Maitland Pennington

Pennington Vice President of Pacific Transport Lines

Maitland S. Pennington, vice president of the National Federation of American Shipping, on April 3 tendered his resignation to the Federation's Board of Directors. At the same time he announced his acceptance of the position of the vice president of Pacific Transport Lines of San Francisco.

Mr. Pennington will remain as vice president of the Federation until his successor is appointed.

A native Californian, Mr. Pennington has been in the steamship industry for the last 20 years, and half of that period he has served with steamship associations. Formerly assistant to the president of Pacific American Steamship Association of San Francisco, Mr. Pennington left this position to become Director of Manning for War Shipping Administration, serving in this position through most of the war period.

Mr. Pennington, 39, one of the youngest major executives in the steamship business, was formerly associated with steamship and stevedoring companies in San Francisco, and at one time published two California newspapers at Meridian and Live Oak.

In 1945 Mr. Pennington was the American delegate to the Preparatory Maritime Conference in Copenhagen, Denmark, and the following year served as American delegate to the International Maritime Conference in Seattle, Washington. He is also a member of the International Joint Maritime Commission and a trustee of the International Shipping Federation.

Pacific Transport Lines was organized a year ago, and is headed by Richard McLaren of San Francisco. It is presently operating C-type vessels, Victory's and Liberty ships in a transpacific service from San Francisco and Los Angeles.

Sperry Realigns Sales Division

George S. Starke, general sales manager, Sperry Gyroscope Co., Inc., Greatneck, N. Y., announces changes in the sales division.

E. F. Lazar, formerly federal and electronics sales manager, has been appointed director of the federal department to handle all contractual relations with military departments of the government. George Tate, formerly director of district sales and service, is the new director of export sales. A. R. Weckel, formerly aeronautical sales manager, has been appointed director of commercial sales, responsible for all commercial product sales and service in the United States and Canada.

George Tate, who has been promoted to director of export sales for the Sperry Gyroscope Company, Inc., Great Neck, New York.

E. F. Lazar, who has been appointed to director of the federal department in the sales division of the Sperry Gyroscope Company, Inc., Great Neck, New York.

A. R. Weckel, who has been promoted to director of commercial sales for the Sperry Gyroscope Company, Inc., Great Neck, New York.

SHORESIDE NEWS

▼ Allen G. Jones, Pacific district manager of General Electric's Apparatus Dept., says farewell officially to Walter C. Smith, well-known engineering consultant for the company. Mr. Smith retired Feb. 1 after 42 years of distinguished service with G-E which began immediately after graduation from the University of Michigan in 1905. A winner of the coveted Charles E. Coffin Award, he has been a director of the American Institute of Electrical Engineers and was vice president of the 8th district of the AIEE.

▲ In the April issue we had a feature article on the S. S. Santa Cruz. This picture shows Vice President Peter Mesquita of General Engineering and Dry Dock Co., embarking for Portugal on April 4. Not going along is E. J. Trask, treasurer of the company, at the foot of the gangplank.

► Jack Dilday, Long Beach Junior Chamber of Commerce president; J. W. Charleville, Port-O-Trade director; General James Meade, Harbor Commissioner; City Manager Carl Wirsching; Mayor Herbert Lewis, Harbor Commissioner; Harbor Commissioner President W. R. (Frosty) Martin; Roger Case, public relations head, and Edsel Newton, Marine Editor, Long Beach Press-Telegram, standing behind committeemen on the site of the Port-O-Trade Exposition.

◄ Around the table, left to right: Dan Dobler, Texas Oil Co.; Gilbert Reeves, Associated Oil; J. G. Daulley, B&M Meat Co.; C. V. Peterson, Texas Oil Co.; J. M. Costello, J. M. Costello Supply Co.; Dwight Eubank, J. M. Costello Supply Co.; Ed Whittemore, Atlas Paint & Varnish Co.; E. L. Ryan, E. L. Ryan Co., Back row, left to right: Johnnie Zinello, Lawrence Mack.

NEW QUARTERS FOR THE BILGE CLUB

Recently the Bilge Club announced a change in their daily luncheon quarters. The new spot is conveniently located and adjoins the Persian Room at 208 W. Anaheim Street in Wilmington.

The members are greatly pleased with the new arrangement. Food is excellent and the conversation is nautical. On the opening day the Bilgers turned out in large numbers, so large that the overflow had to be specially taken care of. Many flowers adorned the luncheon quarters. They were presented by the leading marine houses at L. A. Harbor. To A. F. "Al" Boro as president goes a fine big cheer for his untiring efforts in making the new quarters very pleasant in every way.

Since the opening day the attendance has been at capacity.

▲ Left to right: Arthur Woll, General Petroleum Corp. of Calif.; Al Drew, Florist-Wilmington; Earl Archibald, Sunset Oil Co.; Erle Smith, U. S. Rubber Products; Ed Kellenberger, R. C. Griffith Co.; Walter Richards, Wilmington Iron Works; Arthur Pegg, International Paint Co., Inc.

◄ Left to right: J. Earle, Martin & Turner; Joseph T. Hare, Maritime Commission; Fred Cordes, Deconhil Ship.; Al Boro, J. M. Costello Supply Co.; Arthur Pegg, International Paint Co., Inc.; Erle Smith, U. S. Rubber Products.

Photos on this page by Pacific Marine Review

Repairs at your loading berth

While Bethlehem craftsmen complete repairs to her bow, the M. V. HOEGH SILVERLIGHT loads cargo at her own pier.

Whenever your ship requires repairs consult Bethlehem about its Pier Job Service. Through this service, Bethlehem can reduce lay-up time of your vessel to a minimum and help you to maintain sailing schedules and charter dates.

Backed by a complete range of mobile facilities and equipment, *plus* skilled craftsmen, *plus* experience gained in the handling of thousands of ships in our own yards and at owners' loading berths, this dependable service saves valuable time because loading and repairs can be accomplished simultaneously.

If the extent of a job makes it impractical to do all of the work at your pier, our engineers can arrange a combined schedule of yard and loading berth repairs designed to get your ship back into service at the earliest moment.

All of Bethlehem's ten repair yards on the Atlantic and Pacific coasts of the United States make available to you this time- and money-saving service.

SHIPBUILDING . . . SHIP CONVERSIONS . . . SHIP REPAIRS
NAVAL ARCHITECTS and MARINE ENGINEERS

BETHLEHEM STEEL COMPANY
Shipbuilding Division
GENERAL OFFICES: 25 BROADWAY, NEW YORK CITY

SHIPBUILDING YARDS

QUINCY YARD
  Quincy, Mass.
STATEN ISLAND YARD
  Staten Island, N. Y.
BETHLEHEM-SPARROWS POINT SHIPYARD, INC.
  Sparrows Point, Md.
SAN FRANCISCO YARD
  San Francisco, Calif.
BETHLEHEM-ALAMEDA SHIPYARD, INC.
  Alameda, Calif.
SAN PEDRO YARD
  Terminal Island, San Pedro, Calif.

SHIP REPAIR YARDS

BOSTON HARBOR
  Atlantic Yard
  Simpson Yard
NEW YORK HARBOR
  Brooklyn 27th Street Yard
  Brooklyn 56th Street Yard
  Hoboken Yard
  Staten Island Yard
BALTIMORE HARBOR
  Baltimore Yard
SAN FRANCISCO HARBOR
  San Francisco Yard
  Alameda Yard
SAN PEDRO HARBOR (Port of Los Angeles)
  San Pedro Yard

M. J. Gigy, Pacific Coast manager, Carswell Marine Associates, division of Cargocaire Engineering Corp., and William B. Arnold, head service engineer, Cargocaire.

CARSWELL MARINE ASSOCIATES

The Carswell Marine Associates, sales division of Cargocaire Engineering Corporation with Pacific Coast head office and warehouse located at 417 Market Street, San Francisco, have recently re-organized their sales and service staffs.

According to Merrill J. Gigy, Pacific Coast manager, the new arrangement will take care of the company's sales and expanding service requirements. New and enlarged facilities at the San Francisco headquarters will carry at all times sufficient spares which will expedite the repair and maintenance of the marine and industrial equipment of the many companies represented by the Carswell organization.

In addition to Clifford O. Bergland, the San Francisco staff has acquired the services of Harry W. Parsons, well known in Coast marine circles, and V. R. Keays, formerly with the Lake Washington Shipyards, Seattle.

The Washington and Oregon territory of the Associates will be handled by Consolidated Services, Inc., of Seattle. In Southern California the company is represented by the Wilmington Engineering Service. The sales and service for the Carswell Marine Associates in Western Canadian territory is adequately taken care of by the Heaps Engineering (1940) Ltd., of 966 Hastings Street, Vancouver and of New Westminster, British Columbia.

Carswell Marine Associates recently have been awarded the following additional lines for representation on the Pacific Coast: Robert H. Wagner, South Orange, N. J., Heat Transfer Products, Inc., New York and Carbondale, Pa.; Piezo Manufacturing Co., New York; and Springfield Boiler Co., Springfield, Illinois.

The Carswell head office is at 15 Park Row, New York, and in the marine field the following products are handled by the company: Lake Shore Engineering Company, deck winches; Colby Steel & Engineering Company, cranes and elevators; Ulster Foundry Corporation, bollards, checks, bits, reels and hand-operated deck machinery; Gifford-Wood Company, materials handling equipment, chain conveyors and baggage elevators; The Landley Company, davits; McKiernan-Terry Company, steering gears and anchor windlasses; Products Research Company, zinc-chromate gaskets and water stops, etc; American Ventilating Hose Company, neoprene-impregnated ventilating hose; Piezo Manufacturing Company, universal gears and block joints; Robert H. Wagner, inverted vent valves and smoke indicators; Heat Transfer Products, Inc., Heat exchangers, surface condensers, self-scaling evaporators and air ejectors; Derbyshire Machine and Tool Company, portable jet pumps and marine sewage systems and Springfield Boiler Company, steam generating units.

Fred Archbold Joins Hough & Egbert Co.

Fred G. Archbold, formerly senior surveyor of Lloyds Register of Shipping, who recently retired from that society after more than 30 years, is now associated with Hough & Egbert Co., consulting engineers and marine surveyors.

Mr. Archbold's duties are as surveyor in his new connection, and we know his innumerable friends of many years standing will be pleased to know of his new association.

Hough & Egbert Co. was formed in 1925 to carry out the services started by Edward S. Hough, consulting engineer and marine surveyor in 1902. Hough & Egbert Co. is to be congratulated upon obtaining the services of Fred Archbold.

Top Marine Leaders to Come to San Francisco as Show's Success Assured

IF EVER THE MARITIME INDUSTRY needed to tell the public of its progress and its future, it is this year; and it seems to be grasping the opportunity offered by the National Marine Exposition—in a big way. It is a "magnet" that will be drawing many of the nation's top marine executives to the West Coast at the opening May 12th in San Francisco Civic Auditorium. For the first time in the annals of the industry's long and brilliant history, a national maritime exposition, with all of the fanfare of its New York Premiere in 1946, is being brought to the West Coast. While in the past there have been some marine exhibitions of a local nature on the Pacific Coast, this is the first opportunity the West will have had to view a truly National Marine Exposition, wherein this country's most prominent marine firms will present a million dollar show. It is sponsored by the Propeller Club of the United States.

Practically every field in the marine industry will be represented by large colorful and especially designed exhibits, many of which have been in preparation for months. Plans for novel and unusual methods of presentation of marine products and services have been occupying the minds of topnotch display designers and builders.

Some of the outstanding exhibits of the New York Show will be shipped West in order to present to the audience on the Pacific Coast the same costly displays that were accorded so much favorable publicity in New York City, by the Marine Trade Papers, the daily press and the thousands of visitors who attended the 1946 National Marine Exposition in Grand Central Palace. Notable among these will be the exhibits by: Sperry Gyroscope Company, Inc., Radiomarine Corporation of America, Johns-Manville Corporation, Mackey Radio & Telegraph Company, Worthington Pump & Machinery Corp., Cargocaire Engineering Corporation, The Texas Company, George G. Sharp, Submarine Signal Company, Alcoa Steamship Company, Inc., and American Export Lines, Inc. Some of the unique features of the various exhibits are 'top secret' until Opening Day, according to Roger E. Montgomery, president and general manager of the Exposition, under whose guidance the National Marine Exposition has gained the title, "National Market Place of the Marine Industry."

This year in San Francisco, the National Marine Exposition extends a most hearty welcome to a new and very important group of exhibitors, the Diesel Engine Manufacturers. For the most part, this May's Opening Day will find them on hand as prominent participants in this annual event, for the first time. The diesel group will include among others, Atlas Imperial Diesel Engine Company, Cummins Engines, Enterprise Engine & Foundry Company, Lorimer Diesel Engine Company, Nordberg Manufacturing Company and Worthington Pump & Machinery Corporation.

The San Francisco Bay Area will be well represented by a number of prominent concerns who recognize the importance of the National Exposition, not only from the standpoint of sales, but who also wish to wholeheartedly extend their cooperation to the sponsors and the management, in their aim to further the best interests of the marine industry and the American merchant marine.

Amercoat Booth

New Amercoat Antifouling will be featured in the exhibit of the Amercoat Division, American Pipe & Construction Company Booth No. 1.

Amercoat antifouling is manufactured according to the formula developed by The Battelle Memorial Institute, and is based on the use of a new type of copper flake which produces extremely long-lasting qualities and high efficiency in the prevention of fouling formaations. The display will include performance and test data on these characteristics.

Other products in the Amercoat marine line which will be shown, include Amercoat plastic boottopping, plastic topside finishes and plastic anticorrosive primer. Amercoat sales representatives will be in attendance.

Grant Mitchell, Roger E. Montgomery and Billie Burke, taken on the set of "Accidentally Yours," recent comedy starring Billie Burke and Grant Mitchell, being shown models made by the Sea Scouts.

Depth Recorder

Bendix-Marine will display in its Booth No. 92 a Bendix depth recorder. In attendance will be: R. C. Fuller, sales manager; R. P. Geddes, Jr., supervisor of marine sales; and Walter Rhea, supervisor of marine service; and members of the Toumey Electric and Engineering Company staff, San Francisco distributors.

MONDAY, MAY 12

Opening Ceremonies at 12 noon

PROPELLER CLUB DAY

Admiral Donald B. Beary, Commandant 12th Naval District and Roger E. Montgomery, president and general manager of the National Marine Expositions, Inc. The United States Navy will occupy 800 square feet of space in the Second Annual National Marine Exposition.

Atlas Diesel

Atlas Imperial Diesel Engine Co. expects to display a Model 6EM253 Atlas engine, together with the Atlas "Skipper" and three Chrysler engines.

In attendance will be A. G. Cunnings, E. B. Dunk and J. H. Czock.

Cargocaire

The exhibit of Cargocaire Engineering Corporation will include a sound motion picture in full color, part of which, an animated sequence, will illustrate the latest developments and operating principles of the Cargocaire system of dehumidification and ventilation. This picture will show how every American has a stake in the free flow of world trade, and will show why the American Merchant Marine is such an important part of our national economy.

List of attendants: O. D. Colvin, president; Lawrence Dake, vice president; Merrill J. Gigy, Pacific Coast manager; T. M. Curtin, Advertising manager; and C. E. Paulson, consultant.

Electronic Navigator

The General Electric Company has been developing considerable interest in radar on the West Coast through the demonstration runs on the ferryboat Sacramento on San Francisco Bay and on the Enetei on Puget Sound. The electronic navigator used on the boats, and eventually to be installed on the new President Cleveland will be displayed in the G-E Booth.

WORTHINGTON and PROGRESS!

Now . . . Feed Pumps With Stepless, Automatic Capacity-Control

Unsurpassed for boiler feed and other high-pressure services, Worthington Variflo Pumps provide positive, accurate capacity control up to 150 gpm. The stroke is automatically adjusted to follow capacity demands from 0 to 100%, maintaining maximum efficiency over the entire range.

Compact **Centrifugal** *Refrigeration*

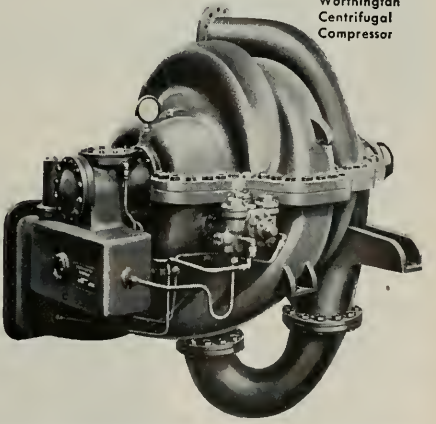
Worthington Centrifugal Refrigeration Systems are light, compact, simple in construction and operation, and quickly adaptable to the changing heat loads of varying climates. Ideal for holding foodstuffs and other perishables at required temperatures and humidities, they are especially designed for large-capacity refrigeration, of 125 to 1200 tons per single unit.

Many other types of Worthington equipment are found on ships of all sizes, from the largest liners to the smallest tugs. The economy and dependability of these units, under severest service conditions, give further proof that on land or sea *there's more worth in Worthington*. *Worthington Pump and Machinery Corporation, Marine Division, Harrison, N. J.*

Worthington Variflo Pump

See You in San Francisco!

Shipbuilders and repair yards, as well as shipowners and operators, will be particularly interested in these units, which are only two of the many on display by Worthington at the National Marine Exposition in San Francisco, May 12 — 17. We are looking forward to meeting you at Booths 41, 42, 53 and 54 in the Civic Auditorium.



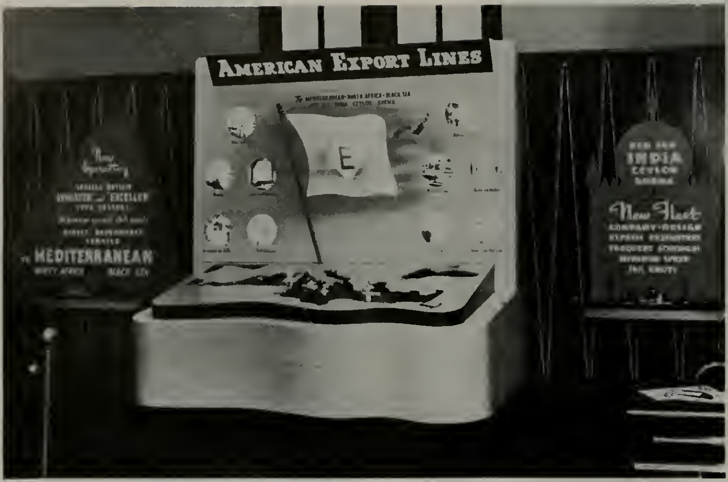
Worthington Centrifugal Compressor

WORTHINGTON

M7-2

Worthington engineers from the rough layout to the ships at sea

Diesel Engines • Turbines & Turbo-Generator Sets • Centrifugal, Steam, Power, Vertical Turbine & Rotary Pumps • Compressors • Air Conditioning & Refrigeration Equipment • Power Plant & Transmission Equipment • Welding Positioners • Liquid Meters • Deaerating Feedwater Heaters



Cut-Out Map

This cut-out map of the Mediterranean range will be the feature of the American Export Lines' exhibit.

Chemical Aids to Engineers

From among the following, the Gamlen Chemical Company will select a group for the Gamlen exhibit in Booth 79. Gamelol Fuel Oil treatment for eliminating sludge and improving the combustion and atomization of fuel oil; Gamlen X Solvent for dissolving water scale and rust in tubes, water lines, etc.; Gamlen D Solvent for cleaning oil tanks; Gamlen H Solvent for cleaning fuel oil preheaters; Gamlen H Special Solvent for removing sludge, gum, and carbon from surfaces of marine steam engines; Firemaster, a seamless monolithic coating for protecting refractory walls of all types of furnaces; Vapjel for prevention of scale formation in salt water evaporators; Gamlen D-9 Solvent for cleaning engine rooms and decks; Sea Suds, a suds-forming detergent for use with salt water; a water-soluble powder for cleaning condensers and other special-purpose chemicals developed around the central idea of improved engine room operation.

TUESDAY, MAY 13

ELECTRONICS DAY

Lorimer to Exhibit

Among the many attractions of interest to work boats and fish boat operators will be an exhibit of the Lorimer Diesel Engine Company of Oakland.

On hand at Lorimer headquarters at Booth 77 will be Ralph Lorimer and Roy Anderson from Oakland. Lorimer representatives for Los Angeles, San Francisco and Seattle will also be "on deck."

Mackay's Booth

Mackay Radio Exhibit will show radar and ship-to-shore phones.

Sperry Loran...

Anytime, in any weather, you can depend on a Sperry Loran fix. because it is determined by crossing two lines of position free from error caused by static, adverse weather or by travelling over land.

These lines are obtained by measuring the time difference between synchronized pulses sent out from a pair of shore stations.

...with the quick-reading Time Difference Meter...

This Meter—another Sperry "exclusive"—indicates the time difference in numerals on an easily read counter. The numerals correspond to data contained on the Loran charts. The direct reading feature saves time. prevents errors. helps get a fix within two to six minutes.

...can lay down shorter "tracks" for ships

Loran serves practically all major sea lanes with continuous 24-hour transmission. The navigator with Sperry Loran can depend on it to help him maintain the shortest, most economical track.

• • •

And in the Aviation Field, Sperry Flight Instruments, Gyropilot and Automatic Approach Control help make flying safer and easier for pilot and passenger alike.

See our exhibit in the
National Maritime Exposition
May 12-17, San Francisco

Sperry Gyroscope Company, Inc.

EXECUTIVE OFFICES: GREAT NECK, NEW YORK • DIVISION OF THE SPERRY CORPORATION
LOS ANGELES • SAN FRANCISCO • SEATTLE • NEW ORLEANS • CLEVELAND • HONOLULU

Against a background of a simulated ship's bridge and radio shack, Radiomarine Corporation of America's complete line of marine communication equipment and the newest loran and radar units will be attractively displayed at the San Francisco National Marine Exposition.

Radiomarine's Shipboard Radar And Loran Sets

Compact and simplified radio and electronic devices developed by the Radiomarine Corporation of America for greater safety at sea and on the inland waterways of this country will be on display.

One of the main features of the exhibit will be the dramatic demonstration of a shipboard radar set in operation. On display will be Radiomarine's Model CR-101 radar which is postwar designed from stem to stern and can be used for anti-collision and navigation purposes on all types of merchant vessels and the larger work boats and pleasure craft.

WEDNESDAY, MAY 14

CHARTER EXHIBITORS DAY

Cummins Diesel Displayed by Watson & Meehan

Various models of Cummins dependable diesel marine engines will be displayed by Watson & Meehan, who are the distributors for the Cummins Engine Company in northern California, maintaining complete sales and service facilities in San Francisco at 1960 Folsom Street and in Fresno at 1827 Amador Street.

Marine Exhibit of Standard Oil

This exhibit features as centerpiece and backdrop, one of the new Standard Marine Service Stations. The station projects diagonally into the booth from the back wall. A wharf supports the station, under which, animated artificial water gives a decided nautical appearance to the scene.

The theme of the show is built around the antics and remarks of a little animated sailor, "Bilgey," who is ably assisted by an attractive young lady. "Bilgey" tells one of his "tall" sea stories, and at the same time manages to work in some valuable advice to boat owners regarding Standard Marine Products and Standard Marine Stations. "Bilgey's" voice was especially recorded for this exhibit by Hal Burdick, whose sea stories and nautical voice are well known to radio listeners.

Standard of California

This sailor, Bilgey, will do a lot of talking—but only to pretty girls.

Night or Day... this is the one!

a smooth new stateroom ... by SIMMONS

This is no ordinary stateroom. It has the Simmons touch of quality ... Simmons charm and modern style. And it has something else that's brand new—the Bulkhead Berth!

Equipped with famous Beautyrest Mattresses, the lower berth is a sofa by day. But a quick, easy maneuver changes the entire setting to one for peaceful sleeping at night. New chairs, tables, chests and other bright, colorful metal furniture complete the Simmons stateroom scene. Get full information from any Simmons office.

Simmons COMPANY

Marine Division

295 Bay Street • Phone GARfield 7800 • San Francisco 11, California

See this "Bulkhead Berth" on display at the National Marine Exposition, Booth 71, San Francisco, May 12 to 17.

The photograph shown, similar to the Booth in the Exhibition, were taken in the large Chicago Studio of the Simmons Company, Contract Department. The interior walls are finished in Amber mahogany. The furniture pieces shown are finished in dove grey and green, and the room is finished in harmonizing upholstery.

Simmons Metal Furniture and Modern Staterooms

The feature of the Simmons Company exhibit will be their new upper and lower wall berths with sofa, featuring the famous marine Beauty Rest mattresses. Other pieces of metal furniture and chairs will also be displayed similar to the equipment illustrated. The design of these staterooms is new savings in space, new comfort, new ease of operations. The staterooms have the maximum comfort of a bedroom by night and can be transformed into a luxurious living room by day.

THURSDAY, MAY 15

AMERICAN MERCHANT MARINE DAY

The Finishes of the staterooms are very attractive with metal furniture that is impervious to heat, cold, stains, burns, and is insect proof. This distinctive furniture is available in a variety of natural wood grains or in colors to suit the decorations of the rooms.

Nordberg to Exhibit Models of Marine Engines

Nordberg Manufacturing Company has engaged two prominent spaces at the San Francisco Marine Exposition to exhibit for the first time on the Pacific Coast several models of its new model diesel and gasoline marine engines, as well as to acquaint interested observers with Nordberg experience and facilities for the building of large marine engine equipment.

One part of this exhibit will supply the Type FSM-96-RSC four-cycle full diesel direct reversible exhaust gas supercharged marine engine. This engine has six cylinders, 9" bore, 11½" stroke, rated 450 hp at 720 rpm. The engine is fitted with a Nordberg planatary type inline heavy-duty reduction gear having a ratio of 3:1 providing a propeller speed of 240 rpm. This engine is representative of several new sizes of four-cycle engines recently added to the Nordberg line in powers from 150 to 1200 hp.

The second part of the Nordberg exhibit will cover two of three sizes of its new Marine gasoline engine series for pleasure and commercial vessels. Exhibited will be the Types FM-230 and FM-320 six-cylinder, high-speed gasoline marine engines complete with reduction gears and power take-off drive for auxiliary equipment. These engines feature several unique developments in the design of attached auxiliaries on this class of engine, as well as conservative rating of both engine and reduction gears.

The C. J. Hendry Line

C. J. Hendry will have a unique exhibit in Section No. 59. Wayne Rossiter, well-known Pacific Coast model maker, is making four three-dimensional units to dramatize some of the marine equipment distributed by C. J. Hendry. These units will be animated, and should make this exhibit one of the most attractive at the show. The four products represented will be Naco Chain, Roebling Wire Rope, Morse Diving Equipment, and Viking Ladders. Other C. J. Hendry equipment will also be on display.

In charge of the booth at various times will be C. W. Linge, manager of Marine Sales; Frank Wagner, assistant manager; Richard Hurst, Ray Cedar, George Lee, and Edward Nichols of Shipyard Sales.

CARSWELL MARINE ASSOCIATES

announce their appointment as

Pacific Coast sales and service representatives for

PIEZO MANUFACTURING CORP.
Universal Gears and Block Joints

ROBERT H. WAGER
Inverted Vent Valves and Smoke Indicators

HEAT TRANSFER PRODUCTS, INC.
Heat Exchangers—Surface Condensers
Self-Scaling Evaporators

DERBYSHIRE MACHINE and TOOL COMPANY
Portable Jet Pumps
Marine Sewage Systems

SPRINGFIELD BOILER CO.
Steam Generating Units

The above firms join the following group of manufacturers whom we have been serving for many years

Lake Shore Engineering Company
Colby Steel & Engineering Company
Ulster Foundry Corp.
Gifford-Wood Company

The Landley Company, Inc.
McKiernan-Terry Corp.
Products Research Company
American Ventilating Hose Co.

CARSWELL MARINE ASSOCIATES

Sales Division of

CARGOCAIRE ENGINEERING CORP.

New York, N. Y.—15 Park Row
Washington, D. C.—726 Jackson Pl. N. W.
San Francisco—417 Market St.
Seattle, Wash.—71 Columbia St.
(Consolidated Services, Inc.)
Wilmington, Cal., 1029 Colon St.
(Wilmington Engineering Service)

Eastern Canada—Triumph Continental
Products Ltd., 5624 Sherbrooke St.,
West Montreal, P. Q.

Western Canada—Heaps Engineering (1940) Ltd.
New Westminster, B. C.

London, England—Cargocaire, Ltd.
Stevinson House, Fenchurch St., E. C. 3

Gotheburg, Sweden—Cargocaire A. B.
Skeppsbrohuset

International Paint Company

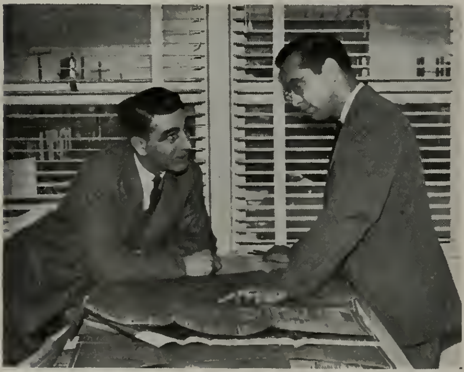
The subject of better preservation of ships through the use of properly designed protective coatings has always been a live topic. Today with new routes, especially through the tropics, and other new conditions of operation, this subject takes on greater importance.

International Paint Co., (Calif.) Inc. will have J. Fred Shingle, vice president, and William Avens, plant manager of the San Francisco Factory in attendance at their Booth No. 75. This will give them the opportunity to greet their many friends of the shipping fraternity from all parts of the Pacific Coast, and discuss matters of ship maintenance.

FRIDAY, MAY 16
DIESEL ENGINE MANUFACTURERS DAY

International Paint Co. (Calif.), Inc., is represented on the Coast by such well known marine men as Arthur R. Pegg, proprietor, International Marine Paint Agency, San Pedro, California, W. J. "Bill" Robbins, Portland, Oregon, Quentin A. Herwig, proprietor, Marine Service, Inc., Seattle, Washington, who is joined by Captain Ernest G. Heinrici as Seattle manager for International Paints.

George G. Sharp



Designers of a very large part of the ships of the American Merchant Marine, George G. Sharp will have a booth at the show and be represented by William New, naval architect in charge. Left to right: James Eddie, electrical engineer and Peter J. Iovin, marine engineer of the Geo. G. Sharp San Francisco office.

Johns-Manville Marine Sheathing

An exhibit of Johns-Manville Marinite and Marine Sheathing. This display shows typical construction made from these light-weight, fireproof panels. Marinite has excellent noise-absorbing and heat-insulating properties, and its fireproof qualities add extra safety to staterooms and crews quarters. The exhibit features Marinite with wood veneer and also with aluminum facings. This strong, corrosion-resistant material has received wide acceptance by leading naval architects, shipbuilders, and the U. S. Maritime Commission.

Fathometer and Pathfinder Radar on Display

Submarine Signal Company will have on display at their Booth models of their Pathfinder Radar and Fathometer models 712Y, 741 and 808 Port Fathometer, including the Junior model and Cape Cod Navigator, together with a new addition, the Electronic voltage regulator.

In attendance at the booth will be: Victor Battani, service manager; Al Huff, service engineer; Warren Holbrook, service engineer; George L. Moore, service engineer; and A. J. Forni, district manager.

The Rope Display of Tubbs Cordage

The Hercules Equipment & Rubber Co., Inc. distributors of many well-known items used constantly in the operation, repair and building of ships and other marine equipment, will show some of their items on hand for quick delivery, such as fire hose, oil hose and packings; also, the renowned Durabla pump valves.

In their well equipped plant they manufacture special gaskets of every size, shape and material; also port strip and molded rubber goods. Hercules, with 25 years on the San Francisco waterfront, is equipped to take care of everything in their line "right now" as they realize that a steamer cannot wait.

Hercules Will Show Many Items

"Among the first exhibitors to contract for space in the 1947 National Marine Exposition was the West's pioneer rope manufacturer, Tubbs Cordage Company. The Tubbs display will be located in the main exhibit hall of the Civic Auditorium in Booth No. 39. Among the products to be displayed will be coils of extra superior manila rope in the sizes generally used by the marine industry, as well as samples of manila fiber representative of the quality being produced in the Philippine Islands today.

Of particular interest to marine men will be an exhibit of knots used by those who sailed before the mast as well as those used by our merchant marine today."

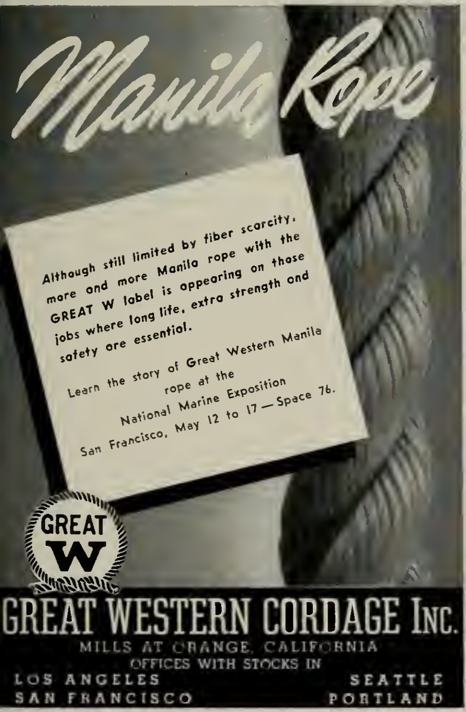
TAKE THE HAZARDS AND MYSTERY OUT OF TANK GAUGING

Wherever fuel, water or other liquid must be measured, LIQUIDOMETER can provide a dependable gauge. These rugged, precision-built remote indicators have proven themselves by years of reliable performance in many exacting marine, railroad, aircraft and industrial applications. Remember these gauge essentials:

- Dependable performance
- Rugged construction
- Instant reading
- Simple operation
- Easy installation
- Minimum maintenance

If you have a liquid measuring problem write:

THE LIQUIDOMETER CORP.
Marine Division
41-52 37th St., Long Island City, N. Y.



Manila Rope

Although still limited by fiber scarcity, more and more Manila rope with the GREAT W label is appearing on those jobs where long life, extra strength and safety are essential.

Learn the story of Great Western Manila rope at the National Marine Exposition San Francisco, May 12 to 17—Space 76.

GREAT W

GREAT WESTERN CORDAGE INC.
MILLS AT ORANGE, CALIFORNIA
OFFICES WITH STOCKS IN
LOS ANGELES SEATTLE
SAN FRANCISCO PORTLAND

SMOKE RINGS BELL

See for yourself at the San Francisco National Marine Exposition, and the Los Angeles National Boat Show.

At the San Francisco Marine Exposition and at the Los Angeles Boat Show, you will see the C-O-TWO Company's Smoke Detecting System in operation. You will see cigarette smoke ring a bell, flash a light, get ready to discharge C-O-TWO. You will see the "inner workings" of the finest marine equipment, such as LIQUIDOMETER gauges. You'll find the new and the interesting in the EH&G display because EH&G are California's leading marine electricians.

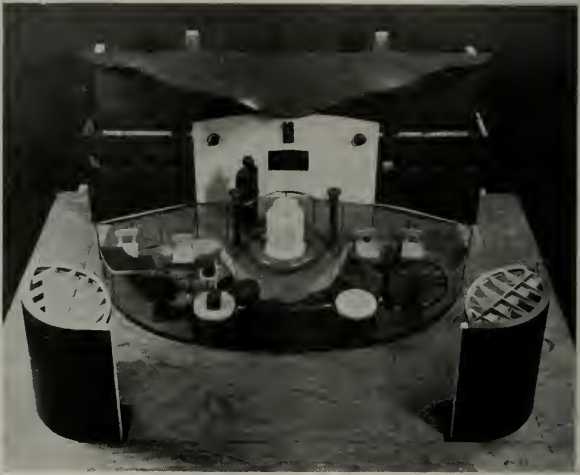
Everything Electrical For Shipboard Use

ETS-HOKIN & GALVAN

MAIN OFFICE: 551 Mission St., San Francisco
218 N. Avalon Blvd., Los Angeles (Wilmington)
233 N. San Joaquin, Stockton
1000 Coast Highway, Newport Beach
Foot of Sampson Street, San Diego
4730 E. 14th Street, Oakland
484 Washington St., Monterey

Since 1920

In the Sperry exhibit a lot of visitors will want to spin the scope. Booth Nos. 47-48. New Sperry's headquarters is at 525 Eighth Street, San Francisco.



Sperry's Booth

In the Sperry Booths Nos. 47-48 will be displayed the Gyro-Compass and Gyro-Pilot; Gyro-magnetic compass and Gyro-magnetic pilot; Radar, Loran; Steering systems and steering controls; accessories such as repeaters, rudder angle indicators and course recorders; 20" searchlight for lighthouse mounting; #00 (¼ hp) steering engine and #0 (½ hp) steering engine.

Also something new just out of the laboratories will be featured—a Magnetic Compass and Pilot combination which provides dependable automatic steering with a magnetic compass. Designed to the needs of smaller craft.

Special radar presentation of the radar scanner and transceiver on top of the roof of the Civic Auditorium, and San Francisco hills notwithstanding, Sperry's radar will obtain a clear sweep of the San Francisco harbor from just west of the San Francisco Oakland bridge to the eastward for about 78 degrees. It will take in the shoreline of most of Berkeley and Oakland and all the harbor traffic in this sector. The radar scope in the Sperry booth will undoubtedly draw an interested audience throughout the show.

The majority of equipment can be visitor-operated. This especially pertains to loran, for which signals will be generated to best present the operational features of this long range navigational device.

Among the key personnel attending will be O. B. Whitaker, manager of Marine Sales, and member of the Exposition's advisory committee; J. F. McConkey, San Francisco District manager; W. I. Selover, Los Angeles district manager; H. S. Burtis, Seattle district manager.

Marine Items on Display by Weeks-Howe-Emerson

The Weeks-Howe-Emerson Co. exhibit at the second annual National Marine Exposition will be a modest display of marine items of interest to steamship operators. Items will include the following: Devoe Marine Paints, Cabodex Red, Hong Kong spar varnish, Super smokestack paints, Aquaplast bottom paint, Wall Rope Works manila rope, Macwhyte wire rope, Getty bronze hardware, and scores of allied lines.

SATURDAY, MAY 17

NAVY AND COAST GUARD DAY

Worthington

Worthington Pump & Machinery Corporation will exhibit various types of pumps, compressors, refrigeration and air conditioning equipment, and a 1000 hp diesel engine.

Of particular interest will be the Worthington Variflo feed pump, which will be in operation. This pump is unsurpassed for high pressure in capacities up to 150 gpm. The stroke of the Variflo pump is automatically adjusted to follow the capacity demands from 0 to 100 per cent, always maintaining approximately maximum efficiency regardless of capacity. The Variflo pump also has many applications in stationary plants for boiler feed, desuperheated feed, product pipeline pumping, product charging in chemical plants and oil refineries. Automatic controls for those services are available.

Also on display will be a Worthington centrifugal refrigeration compressor.

T. J. Kehane, commercial vice president; I. W. Jackman, manager, marine division; W. B. Moore, manager, marine engine division; J. P. McArthur, manager, San Francisco office; J. G. Murphy, manager, Los Angeles office; E. W. Hammond, assistant manager, Los Angeles office; E. D. Schively, manager, Seattle office; H. D. Moore, C. D. Cummins, F. J. Whelan, manager, Reciprocating Pump Division; A. L. Richards, H. E. Sargent, B. G. Jones, F. W. McCann, H. P. Henderson, W. A. Penner, D. A. McCalman, K. G. Mann, and Mrs. F. M. Hastings.

for TRADE·TRAVEL·DEFENSE–

The AMERICAN MERCHANT MARINE!

NATIONAL MARITIME DAY–MAY 22, 1947

SPONSORED BY THE PROPELLER CLUB OF THE UNITED STATES

Movies Augment Display at Texas Exhibit

Located in Space 68 in the San Francisco Civic Auditorium, The Texas Company's exhibit at the Exposition will feature a complete line of specialized marine lubricants. The exhibit is under the supervision of R. B. Fox, Texaco Marine Engineer and it is expected that the following Texaco personnel will be in attendance at the exhibit: Messrs. W. H. Ball, E. J. Bourgeois, W. C. Foy, G. V. Garner, V. C. McIlraith, and H. E. Paul.

The Texas Company with marine lubricants available in 51 countries and over 370 ports is one of the best known trade names in the shipping business and the red star with the green "T" is familiar to sailors the world over.

Four moving pictures will be shown to the public at this booth. They are based on the bombing of Hiroshima; oil in Saudi Arabia; our B-29 bombers; and the Texas tanker fleet.

Co $_2$ and Liquidometer

Ets-Hokin & Galvan's Booth will display an actually operating CO_2 Company smoke detecting cabinet. By introduction of cigarette smoke into one or more of the air sampling ducts, the cycle of operation of the device is started. A visual indicator tells what lines are affected, an alarm is sounded, and mechanical means of automatically discharging CO_2 gas are set up.

Also on display will be models of the Liquidometer Co. remote reading gages and rudder angle indicators, as marine accessories.

Liquidometer's rudder angle indicator as is to be displayed in the Ets-Hokin & Galvan booth.

Great Western Cordage Exhibit

Rope making is one of the earliest skills known to man. Nearly 6000 years ago rope played an important part in the building of the Pyramids of Egypt. Xerxes' army crossed the Hellespont on a bridge of boats held together by giant hawsers. From ancient China, from the land of the Incas, and from other centers of early civilization come records of the use of rope in the dim dawn of history.

Of course, it is a far cry from the crude ropes of those earlier times, made of vines and hair and sinew, to the modern scientific development of cordage today. New fibers, new methods, new uses, undreamed of by the ancients, have made the present day manufacture of rope an exacting process.

See their complete line and learn the interesting story of Great Western manila rope at Booth 76.

Women's Organization for the American Merchant Marine

The ladies will exhibit a selected group of ship models, certain of which will bring nostalgic thoughts to many a shipping man. Their Booth Nos. 136-137.

World Trade

The World Trade Week committee of the San Francisco Chamber of Commerce will present an assortment of products imported or exported, with an indication of the countries concerned with the trade. Booth No. 141.

Pacific Marine Review

The entire executive, business and editorial staffs of this publication will be on hand from time to time, and will welcome opportunities to be of service to the industry. Booth No. 112.

Western Electric Company Booth

A new type of Marine Radiotelephone equipment is being displayed by the Western Electric Company. The 248A marine radiotelephone equipment, designed by Bell Telephone Laboratories from handset to antenna is housed in a single cabinet with a remote control unit. It provides two-way long or short distance telephone communication with multi-frequency high quality service. Instant selection of any of 30 optional frequencies between 2 and 20 megacycles per second with quartz crystal control is provided. Three radio receivers facilitate the handling of traffic and the monitoring of three stations simultaneously.

The United States Maritime Commission, its membership completed as Joseph K. Carson, Jr., of Portland, Ore., assumed his duties, poses after the ceremony of Mr. Carson's oath of office on April. I. Left to right, they are: (seated) Commissioner J. Grenville Mellen and Vice Admiral William W. Smith, USN (Ret.), Chairman; (standing) Commissioner Raymond S. McKeough, Commissioner Carson, and Commissioner Richard Parkhurst. Mr. Carson, former mayor of Portland, was sworn in by United States Supreme Court Justice William O. Douglas before a large gathering of government officials at the Maritime Commission headquarters, Commerce Building, Washington, D. C.

Shoreside Personalities

Henry W. Clark, general manager, Waterfront Employers Association.

Col. Clark Named V. P. of Waterfront Employers Assn.

Henry W. Clark, who has been serving as an administrative assistant to the President of the Waterfront Employers Association of the Pacific Coast since last November, has been named general manager of that organization. The announcement was made by Frank P. Foisie, W.E.A. president.

Before coming to the Waterfront Employers Association, Clark was General Manager of the Alaska Development Board.

Clark, an Army Colonel in World War II, holds the Legion of Merit for his services as Chief of the Athletic Branch of the Special Services Division. While in the Army he had the distinction of serving in every American theater of war from 1942 to 1946.

Prior to entering the Army, Clark was Field Representative for the Federal Security Agency for Alaska and Newfoundland from 1941 to 1942 and from 1937 to 1941 he served as Director of Athletics at Lafayette College. From 1927 to 1937 he was Assistant Director of Athletics at his Alma Mater, Harvard University where he was awarded his M. A. degree in 1927.

As a member of the Harvard University football team of 1922, he was named as first string All American tackle.

Clark is also the author of two authoritative books on Alaska. Those are *Alaska,* the *Last Frontier* and *The History of Alaska.*

Institute of Navigation Northern California Sectional Meeting

The first Northern California Sectional Meeting of the Institute of Navigation will be held on Saturday, May 10, 1947, at the United States Maritime Service Training Station, Alameda, California.

The meeting will be under the direction of Captain M. E. Crossman, Superintendent of the Station, and will begin at 1400. This first meeting will be an informal dinner meeting, its primary purpose to serve as an implement to help the regional members to become better acquainted. The agenda of the meeting will include a tour of the Training Station. Two speakers will give addresses on subjects of interest to members of the Institute. It is also planned to elect a committee to plan for future meetings, and to set up the machinery so that the Northern California Section members can function as a group.

It is expected that the Western Regional Meeting of the Institute will be held in Los Angeles, California on June 7, 1947, and that the National Meeting will be held in Washington, D. C. on June 25-26, 1947.

States Steamship Opens Seattle Office

The States Steamship Company announces the opening of offices in Seattle to handle the firm's affairs as well as those of its affiliated services, the Pacific-Atlantic Steamship Co., and the Quaker Line in the Puget Sound Area. The new office is located in 307 New World Life Building.

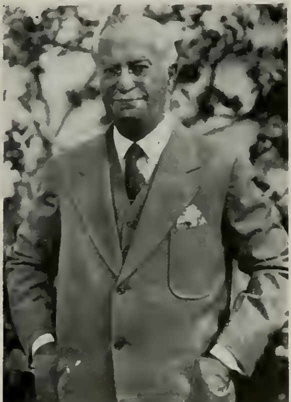
Eugene Moran Celebrates 75th Birthday

Eugene F. Moran, dean of New York City port's towboat men, celebrated his 75th birthday on March 24. Officers and stockholders of the Moran Towing & Transportation Co., Inc., and a group of friends tendered him a dinner at Sherry's.

Mr. Moran, who is now chairman of the board of the Moran company founded by his father, the late Michael Moran, has spent almost all of his life with tugs, barges and other harbor craft. He has seen many changes in the port, but he calls the deepening, widening and straightening of Ambrose Channel the greatest single factor contributing to this harbor's greatness. Fixing up the channel, he says, let the big vessels get into the Port of New York speedily and safely, with resultant growth of its business.

In World War II Mr. Moran reassumed the company's presidency while his nephew, Rear Admiral Edmond J. Moran, was on Navy duty. He relinquished the post upon the Admiral's return to civilian life.

Eugene F. Moran, chairman of the Board of Moran Towing & Transportation Co., Inc. —*Photo courtesy Moran Towing.*



Many Vendors Served This Vessel

In the March Pacific Marine Review there appeared a story about a river all steel streamlined automobile carrying vessel, the Commercial Clipper. An example of the scope of the manufacturing effort, apart from the shipyard, is indicated by the following list of vendors who supplied major equipment for this vessel and its companion, the Commercial Express:

Quarters insulation—"Fibreglass".

Quarters lined with asbestos transite.

Engine room and pump room soundproofed with Fibreglass acoustic blanket and expanded metal.

Floor covering—"Ruggedwear"—Flexrock Company

Galley range—"Shipmate #540"—Stamford Foundry Company.

Electric refrigerator in galley—"Carrier".

Mess tables and chairs—Missouri Furniture Company.

Deep freeze box—Amana Society.

Asphalt tile on floors in quarters, galley, mess and pilothouse—Armstrong Cork Company.

12 exhause silencers (1 for each engine)—Maxim MUC-10.

Heat exchangers (1 for each quad)—Ross CP-1004.

Pilothouse control for engine throttles and propeller pitch adjustment—Adel Precision Instrument Company.

Steady bearings for propeller shaft—The Medart Company.

Goodrich cutless rubber bearings for stern struts—Lucian Q. Moffitt.

Wire rope and fittings—Leschen and Sons.

Steering gear—St. Louis Shipbuilding and Steel Company.

Gasoline engine power winch—Clyde #7515.

Plumbing fixtures—Crane Company.

Automatic water pressure sets—Fairbanks-Morse.

Sewage pump sets—Swaby Fig. 5200 #3 Vertical Non-Clog.

Hot air furnace, blowers, ducts, etc.—Grossman and Company, St. Louis, Missouri.

General service pump—Fairbanks-Morse.

General service engines (LeRoi D-140)—Western Machinery Company, St. Louis.

Raw water pumps—Fairbanks-Morse.

Fire hose and fittings—Bushnell Packing Company, St. Louis.

Fuel oil transfer pumps—Oberdorfer MD-47.

10 kw motor-generator sets—Western Machinery Company.

Dayton-Dowd D-12 bilge and ballast pumps—Reeves and Skinner, St. Louis.

Switchboard—Wm. Wurdack Manufacturing Co., St. Louis.

Arc searchlights 19″—Carlisle-Finch.

Navigation lights—W. J. Tiebout.

Running light indicator panel—Electric Service Control, Inc.

Starting batteries "Exide"—Electric Storage Battery Company.

Ship's bell—Bevin Brothers.

CO_2 systems—Walter Kidde and Company.

Wood workboats—Edwards Boat Works.

Sound-powered telephones—Hose McCann.

Battery powered telephones—Graybar, St. Louis.

Windshield wipers—Trico Products.

Airhorns 8″ duplex—Kahlenberg Brothers Company, Two Rivers, Wis.

Portlights—The Rostand Manufacturing Company.

Pilothouse windows—Kearfott.

Expanded metal—Wheeling Corrugating Company.

Welding studs and insul. pins—Nelson Sales Company.

Bronze bushings and bronze castings—Bronze Alloys Company, St. Louis.

Electric motors—Century Electric Company, St. Louis.

3 quad multiple engine units and adjustable pitch propeller — Detroit Diesel Engine Division, General Motors.

Matson C-3 Cargo Vessels

(Continued from page 47)

and rat proofed. Special hatches and or bulkhead fittings are to be installed for convenience in working the scrapers, and it is believed that the capacity load of 7000 tons sugar will be loaded or unloaded into or from these vessels in less than 24 hours.

Tonnage Openings

This type of C-3 vessel is in the shelter deck class. All main transverse bulkheads have tonnage openings which exempt shelter deck spaces from tonnage measurement. Wherever the changes made blank off these tonnage openings new tonnage openings are fitted.

Deck Machinery Changes

Eighteen topping lift winches, 9 right and 9 left, are to be installed. Each of these will be an American Hoist and Derrick Company model 114-B winch, complete with three horsepower motor and controls. Mounted with adequate structural foundations either on top of the resistor house or on the king posts, these winches handle the wire rope topping lifts from the 5 and 10 ton cargo winches and are designed to top when the gear is light, and hold when the gear is loaded. Master controllers are to be for exterior mounting and to be located adjacent to the cargo winch controllers.

Two boom topping winches, one right and one left, are to be installed at the forward end of No. 5 hatch to handle the wire rope topping lifts from the two 30 ton booms at the station. These winches are designed to top under full load of the booms and their maximum lift, and are driven by 50 bhp electric motors. They are American Hoist & Derrick Company machines model M-2317-A.

Most of the ships under description have been carrying a 30 ton boom stowed on deck for use in emergency heavy lifts. Matson carries heavy machinery and other heavy lift items quite frequently and the stepping and rigging of heavy booms is not only a time consuming process but sometimes quite hazardous.

As converted, these C-3's will have two 30 ton booms permanently stepped at the forward end of No. 5 hatch and rigged for lifting and topping. The two 10 ton booms now located at the forward end of No. 5 hatch will replace the 5 ton booms at the after end of No. 4 hatch.

An American Hoist & Derrick Company model M-2317-B electric drive capstan will be installed on the forecastle deck just aft of the anchor windlass. This capstan will be driven by a 34 hp motor located below on the shelter deck level and driving through suitable gearing and a vertical shaft. This machine will handle mooring lines from any of the roller chocks located around the forecastle head without interferring with the operation of the anchor windlass. Many minor changes are being made as, for instance, the installation of 144 cargo lashing eyes on the weather deck. These eyes are of 1½ inch steel with four inch opening and with ends slightly flattened, bent 90° and welded to the deck. When finished, these vessels will be ideal carriers for a mixed cargo of bulk sugar, molasses and frozen or canned pineapple eastbound, and will still be profitable on the westbound trip with general cargo, lumber deck loads, and special heavy items. With their 8500 shaft horsepower (normal) and plenty of reserve in boilers and turbines, these ships can make 18 knots easily with one boiler down and at very good economy for either speed.

A new capstan over the forecastle is added to facilitate handling the mooring lines in the smaller Hawaiian ports.

Hatches are all double rigged, enabling two stevedoring gangs to work simultaneously in each hatch.

Plans call for the eventual installation of commercial radar sets as standard navigational equipment.

Although none of the new Pacific freighters will carry passengers, all will have ship-to-shore telephones. While primarily for harbor use, the system is effective up to more than 600 miles at sea, depending upon atmospheric conditions. Calls may be placed from either ship or shore, so that relatives and friends of the crew can reach the ship through long distance from any point in the United States.

The C-3's which will carry the greater bulk of Matson's shipments to and from the Hawaiian Islands will carry names in an occupational pattern preceeded by the word "Hawaiian." This carries forward the naming program inaugurated by Matson prior to World War II.

In addition to the C-3's, three Liberty-type freighters will be engaged in carrying lumber, fertilizer and other bulk items between the Pacific Northwest and Hawaii.

Four C-2 cargo ships will be operated between Pacific Coast ports and Australia-New Zealand via Samoa and Fiji by Matson's wholly owned subsidiary, The Oceanic Steamship Company.

Four vessels from the prewar fleet will be retained in service.

(Continued on page 120b)

Matson C-3 Cargo Vessels

Three T-2 tankers will operate coastwise and occasionally to Hawaii in contract tanker service.

The Matson C-3s will bear the following names:

Hawaiian Merchant
Hawaiian Builder
Hawaiian Planter
Hawaiian Banker
Hawaiian Craftsman
Hawaiian Educator
Hawaiian Retailer
Hawaiian Citizen
Hawaiian Fisherman
Hawaiian Packer
Hawaiian Rancher
Hawaiian Farmer
Hawaiian Refiner
Hawaiian Pilot
Hawaiian Wholesaler
Hawaiian Shipper

The three Liberty Ships on the Pacific Northwest and Hawaiian route will be named:

Hawaiian Forrester
Hawaiian Lumberman
Hawaiian Logger

The four C-2 freighters operated by Oceanic Steamship Company will be named for California counties, as follows:

SS Sonoma SS Sierra SS Ventura SS Alameda

Present plans call for retaining four of the prewar freighter fleet with their original names.
SS Manukai, SS Mokihana, SS Manulani, SS Mahimaki.

Ingalls Launching

The Mormacsaga, huge all-welded cargo-passenger vessel for Moore-McCormack Lines, was sent down the ways recently at the Ingalls Shipbuilding Corporation yard in Pascagoula, Miss. She was the 7th of a fleet of 17,600 ton ships built by Ingalls for the New York company.

New Rodpak Executive

Rodpak Manufacturing Company, San Francisco, announces the entry into the firm of G. M. Forslund in the capacity of vice president. Mr. Forslund, who will act as sales manager for this industrial concern, has had many years of experience in the field of mechanical packing.

Caulkers and Grommets

(Continued from page 54)

for warming the caulking compound; a "paying" can with a long spout; and a boy or helper.

We understand that the caulker's union still, as formerly, do a certain footage of seam for a day's work. On straight open deck work this footage may be finished in four to six hours. In more difficult locations it may take a full day. But no caulker will work overtime nor do more than the day's stint. In the days of "wooden ships and iron men" San Francisco had, by a waterfront saloon, an institution called the "caulkers bench." Here all the available caulkers used to sit in the sun and wait for employment and whoever came seeking a caulker had to take the man at the left end of the bench.

A wooden deck is carefully fitted to the steel deck and then bolted to it. The holes for the bolts are countersunk in the deck timbers to take a washer and nut, and after the nut has been properly tightened, the top of countersink is plugged watertight with a wooden plug. A short time before the war a machine was developed at Mare Island Navy yard, known as the Nelson stud welder, which spot-welds studs to the steel deck through the holes drilled in the timbers. This machine is in use on the Cleveland and thus a timber deck fastened to the steel deck by one of the most modern devices in the shipbuilding industry is being made watertight by the most ancient of skilled handicrafts.

Deck planking on large vessels is usually 4" x 4" in dimensions and on this ship is Oregon pine with margin timbers of South American Teak or Wohlerwood. The margin timbers are shaped to conform to the curvature of the hull and notched to receive the ends of the planking. All the planks are fitted so as to leave a caulking seam of uniform width.

S. S. Cleveland and her sister have an aluminum house on the boat deck and the aluminum top of this house supports another wooden deck, similar to that on the boat deck but with some interesting detail differences.

It was found impractical to weld studs to the aluminum deck so holes are bored through and through-bolts used. This makes a problem in preserving watertightness around the bolt. To accomplish this the bolts are installed with washers and grommets. Grommets for this purpose are circular wreaths of loosely woven cotton twine and are laid in white lead for the upper side and in varnish for the lower side. These grommets as furnished for the job by C. J. Hendry, San Francisco ship chandler, are made by Blindcraft, the San Francisco Association for the blind. It is a touching thought that sensitive mobile fingers groping in the eternal dark should fashion these devices to make secure from ceiling drip the living quarters of officers on a big transoceanic passenger liner.

On the aluminum deckhouse we noted the excellent riveting job in aluminum rivets furnished by Alcoa. Also very noticeable was the neat workmanship on the aluminum waterway bordering this deck. This shallow trough was fabricated in the Bethlehem shops and welded together on the ship.

Wooden planking laid on aluminum decks is, we believe, rather new. The entire job of laying the wood decks on President Cleveland and President Wilson is being done by Builders Wood Flooring Company of New York. A different type of caulking compound is used with the aluminum based deck than that based on the steel.

Aluminum hand rails are used on these upper weather decks, and Welin aluminum boats are hung on Welin gravity type davits. Part of the davit track is also of aluminum. Aluminum is finding many uses in this ancient craft.

Dollar's Supreme Court Decision

(Continued from page 49)

fully paid and satisfied, not from subsidy allowances or from earnings, but from the sale of the assets of the company itself which it owned when the shares were transferred to the Commission.

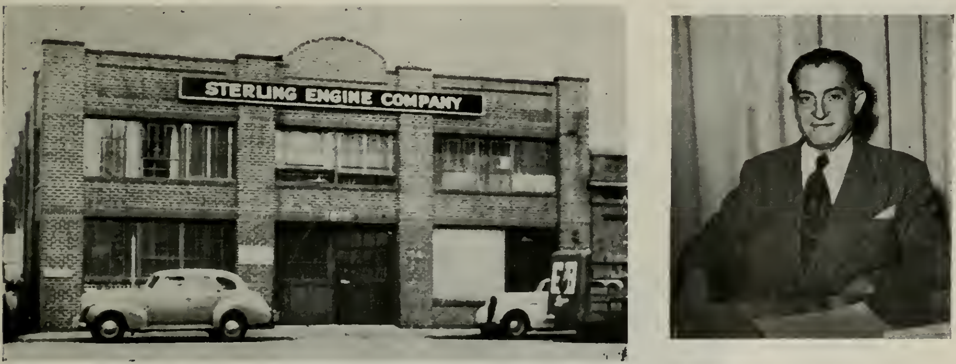
After the debt was paid, R. Stanley Dollar, acting on behalf of the shareholders, demanded return of the stock. But, the Maritime Commission insisted that it was entitled not only to full payment of all obligations to the United States, but also claimed the right to retain the stock of the company, and offered it for sale to the public. Bids were asked for and received. When opened on September 10, 1945, the high bidder was a syndicate headed by Charles U. Bay, now United States Ambassador to Norway, with an offer of $8,611.276.90 for the stock.

Mr. Dollar and his associates then brought suit in the District Court for the District of Columbia seeking an order restraining the Commission from dispersing the stock to the public until its ownership was determined. In that suit the court issued a restraining order pending determination of the right of the Commission. The District Judge, however, dismissed the action without trial on the merits of the case, upon the plea of the Attorney General that the suit was one against the United States which had not consented to be sued.

This decision was appealed to the Court of Appeals of the District of Columbia, which court reversed the District Court and upheld the right of R. Stanley Dollar and his associates to have a trial and a decision of their case on the merits. The Court of Appeals held that the complaint in the District Court stated a claim which, if proved, entitled the plaintiffs to relief.

Counsel for the Commission then filed a petition for hearing in the Supreme Court. A hearing was granted and it was held on February 11th and 12th of this year.

In the decision given by the Supreme Court on April 7, it upheld the right of the stockholders of American President Lines, Ltd. (formerly Dollar Steamship Lines) to a trial upon the merits of their case against the Commission. Every effort will be made to bring the suit to an early trial in the District Court and to final decision.



STERLING ENGINE NEW SAN FRANCISCO PLANT
Above is the new Sterling Engine Company's headquarters in San Francisco at 1040 Bryant Street. In the March issue of Pacific Marine Review announcement was made of the appointment of W. Edgar Martin as Pacific Coast sales manager of this organization. At right: Hans Bohuslav, Pacific Coast district manager of Sterling.

The plant for National Lead Comin Los Angeles.

National Lead's Expansion

Looking ahead to an era of unparalleled growth and building activity on the Pacific Coast, the National Lead Company has broken ground for a new paint plant in Vernon, California.

The new plant, which will be located on East 26th Street near Soto Street, will house a complete factory for the production of "Dutch Boy" paints, extensive warehouse facilities and sales offices for Southern California and Arizona under the supervision of H. S. Irwin, divisional manager for the company.

The factory will make full use of the most modern manufacturing and handling equipment laid out to streamline production and deliveries to Southern California property-owners, painting contractors and industrial users of paint.

Features of the new plant will be a high degree of mechanized handling of materials and finished products, latest safety devices, special attention to employee's working conditions and a complete laboratory for paint formulation and testing.

At a session of the American Chemical Society in Los Angeles the prediction was made that paint industry sales for 1947 will reach $1,000,000,000, and James L. Caruth, Pacific Coast manager for the company, expects the output of this new factory will materially increase the volume of paint and paint products manufactured by the National Lead Company for the Pacific Coast market through existing factories in San Francisco and Melrose, California.

The plant was designed by John J. Gould, consulting engineer. The General Contractor is the Fred E. Potts Company of Los Angeles.

Welding & Cutting Center in Emeryville

The opening of a new store and district office to meet the increased demand for welding and cutting gases and equipment stimulated by the considerable industrial growth of the Emeryville, Oakland, East Bay area is announced by the Air Reduction Sales Company. This new retail store which is located at 1485 Park Avenue began business operations early in February.

The new Airco headquarters is housed in a completely modernized two-story building. In addition to retail sales and storage departments, space has been provided for a demonstration room where new techniques and adaptations of the oxyacetylene flame and electric arc processes and products developed in the firm's eastern laboratories are displayed. The office is staffed by representatives especially trained to assist customers in the solution of welding, cutting and related problems.

This new Emeryville store and office is under the direction of H. W. Saunders, district manager, who is a well known and popular figure in the Emeryville area.

Air Reduction plant in Emeryville, California, the new welding and cutting supply center for Airco.

Pacific Marine Review

NEWS FLASHES

BIDS OPEN ON ARMY TRANSPORTS CONVERSION

Todd Dry Dock Company's San Pedro yard was low bidder April 18, when bids were opened at the San Francisco Port of Embarkation on the conversion of wartime P-2 transports to permanent Army transport design. The bids are being analyzed and an announcement will be made from Washington.

Reported figures are as follows:

Todd Dry Dock Company, San Pedro yard	$ 6,354,496	270 days
Bethlehem, San Pedro yard,	6,864,000	455 days
Bethlehem, San Francisco yard, (1 ship)	6,866,300	455 days
(2 ships)	13,557,300	545 days
General Engineering & Drydock Company	6,893,610	469 days

There are three vessels to be converted on the West Coast with a possible fourth, and two on the East Coast.

* * * * *

MARITIME COMMISSION APPROVES PLANS FOR V-2000

Announcement was made from Washington on April 11 that the round-the-world service V-2000 type ships have been approved and that bids would be called for five ships.

* * * * *

FORMER MOORE WEST YARD OFFERED FOR SALE

Bids will be received until 10 a. m. May 6th for the sale or lease of the West Yard operated during the war by Moore Dry Dock Company of Oakland, California. It is offered only as a complete unit. Information is available from War Assets Administration office, 1182 Market Street, San Francisco.

* * * * *

SHIP LINES ORDERING RADAR

Announcement is made that the Standard Oil Company, the Union Oil Company, and the American President Lines are ordering radar equipment for all of their offshore vessels.

* * * * *

BRAZIL TO ORDER MORE SHIPS IN U. S.

Lloyd Brasileiro which has been building 24 ships in the United States and Canadian yards announces an intention of building an additional 18. They are to be 15 to 17 knot ships of 5000 tons.

* * * * *

OPENING BID DATES ANNOUNCED FOR SALES OF VESSELS BY MARITIME COMMISSION

<u>May 7, 1947 at 2:30 p.m. EST:</u> For the sale of the four damaged Liberty cargo vessels Francis W. Pettygrove (243,185), Harrison Gray Otis (242,748), Henry Miller (244,841), and Pat Harrison (242,721), for scrapping purposes.

All four vessels are aground in Gibraltar Bay and there is no restriction as to the citizenship of the purchaser. The vessels are offered under Invitation for Bids No. 317, dated February 12, 1947.

May 7, 1947 at 2:30 p.m. EST: For the sale of 59 vessels, under Invitation for Bids No. 333 dated April 10, 1947.

May 7, 1947 at 2:30 p.m. EST: For the sale of the BETA (215758), CARTAGO (212584), and the PACO (220335) in the Brunswick River Reserve Fleet; the GEORGE W. BARNES (216388), THERMO (220640), and the W. W. BRUCE (216033) in the James River Reserve Fleet; the FREDERIC R. KELLOGG (215424) and the GLENPOOL (213369) in the Mobile River Reserve Fleet; and the ABANGAREZ (212612), EDWARD L. DOHENY (212683), TOLOA (228203), and the WEST KYSKA (217224) in the Suisun Bay Reserve Fleet, for scrapping purposes. Bidding on these twelve ships is limited to United States citizens under Invitation for Bids No. 341 dated April 14, 1947.

May 8, 1947 at 2:30 p.m., EST: Public drawing for the sale to veterans of 97 small vessels under Invitations for Bids No. VP-8

May 9, 1947 at 12:15 p.m., EST: For the reconversion of the EX USS STARLIGHT - AP 175. Full information in contained in the Invitation for Bids TDR No. 152 dated April 11, 1947.

May 9, 1947 at 12:15 p.m., EST: For the reconversion of the EX USS TOLLOND - AKA 64. Full information is contained in the Invitation for Bids TDR No. 153 dated April 11, 1947.

May 9, 1947 at 12:15 p.m., EST: For the reconversion of the EX USS WAUKESHA - AKA 84. Full information is contained in the Invitation for Bids TDR No. 154 dated April 11, 1947.

May 9, 1947 at 12:15 p.m., EST: For the reconversion of the EX USS TATE - AKA 70. Full information is contained in the Invitation for Bids TDR No. 155 dated April 11, 1947.

May 9, 1947 at 12:15 p.m., EST: For the reconversion of the EX USS OTTAWA - AKA 101. Full information is contained in the Invitation for Bids TDR No. 156 dated April 11, 1947.

May 9, 1947 at 12:15 p.m., EST: For the reconversion of the SS METEOR - troop transport. Full information is contained in the Invitation for Bids TDR 157 dated April 11, 1947.

May 12, 1947 at 2:30 p.m., EST: For the sale of the damaged, 503-foot T2-SE-A1 tankers TRIMBLE'S FORD, Official No. 248744, JOSHUA TREE, Official No. 247055, and KAPOSIA, Official No. 247686. TRIMBLE'S FORD and KAPOSIA are located in the Wilmington, North Carolina, Reserve Fleet, Wilmington, N. C. JOSHUA TREE is located in the Mobile Reserve Fleet. Mobile, Alabama. The vessels will be sold for operational purposes with bidding limited to United States citizens, under Invitation for Bids No. 336 dated March 25, 1947.

May 12, 1947 at 2:30 p.m., EST: For the sale of 32 small vessels, under Invitation for Bids No. 339 dated April 18, 1947.

May 14, 1947 at 2:30 p.m., EST: For the sale of the cargo vessel SS UNICOI, located in the Suisun Bay, Calif. Reserve Fleet, Suisun Bay, California, for scrapping. Bidding is limited to United States citizens under Invitation for Bids No. 342 dated April 16, 1947.

Copies of Invitations to Bid on large vessels for sale and scrapping purposes may be obtained from the Director, Large Vessel Sales Division, U. S. Maritime Commission; TDR's for the repair and conversion of vessels may be obtained from the Director, Technical Department; and Invitations to Bid on small vessels may be obtained from the Director of Small Vessel Sales, U. S. Maritime

Commission, Washington 25, D. C., and in some of the Maritime Commission's regional offices.

* * * * *

NAVY TASK FLEET TO VISIT SAN FRANCISCO

The resumption of Fleet visits to San Francisco will be marked by the arrival of 28 ships headed by the Battleship Iowa on May 23.

* * * * *

BELAIR SHIPYARD, SALE OR LEASE

The War Assets Administration will receive bids until May 15, 10:00 a.m., for the sale or lease of Belair Shipyard near South San Francisco. The yard includes graving docks and miscellaneous buildings used by Barrett & Hilp during the war.

* * * * *

GAS TURBINE SHIP FACING DELAY

Production delays and lack of a suitable ship will postpone experiments on marine gas turbines until next year. Plans call for installation of a gas turbine in a Liberty type collier, replacing the ships reciprocating engines. The turbine is being built by the Elliott Company and is to be installed by Federal Shipbuilding & Drydock Company.

* * * * *

SHIP REPORTS TO CONGRESS DUE IN MAY

Chairman Bradley of the House Merchant Marine Committee announces plans to set May 15 as deadline for sub-committees to report legislation relating to maritime affairs.

* * * * *

M.C. TO CONTRACT FOR VESSEL REPAIRS

The Maritime Commission revoked, effective April 10, the authority of its general agents to award contracts for vessel repairs and has placed this authority to local managers of the Commission's Maintenance and Repair Division.

W. P. Fuller & Company, South San Francisco, has awarded contract for three story 102 x 281 foot building for expansion of paint factory. Expansion including new equipment will cost $1,000,000.

L. A. Young Spring & Wire Corporation, Oakland, has acquired 17 acre site and will convert three buildings and construct additional one, to house automobile cushion division. Total expansion will cost $1,500,000.

Fairbanks, Morse & Co., headquarters at 2401 Santa Fe Ave., Los Angeles, has just completed a 100' x 200' addition at 306 E. Commercial St., Pomona, which will afford a 90,000 square-foot mechanized foundry. Company is also adding an assembly building to contain over 19,000 square ft. for increased production of deep-well turbine pumps.

* * * * *

PLYMOUTH CORDAGE BUYS NEW ORLEANS MILL

With an eye on the rapidly expanding business in the South, Plymouth Cordage Company officials announce the purchase of the Federal Fiber Mills, located at New Orleans, La., and to be operated as a division of the Plymouth Company.

* * * * *

NEW PROJECTS IN BAY AREA

Glass Fiber Products Division of White & Holcombe, Pier 5, Embarcadero, San Francisco, will engage in manufacture of industrial, marine and consumer applications of Owens-Corning Fiberglass, including mattress covers.

The Valianos Company, Army and Indiana, San Francisco, will erect $300,000 vegetable oil processing plant including two 50 x 120 foot buildings and a 100 x 300 foot warehouse. Plant will represent total investment of $700,000.

Pittsburgh-Des Moines Steel Company, Santa Clara, California, will erect $500,000 steel fabricating plant on 70 acre site. Firm is one of foremost in fabricating pipe line bridges, wind tunnels and grandstands.

Rheem Manufacturing Company, Richmond, California, has purchased a 56 acre site west of S.P.R.R. and north of road 20 for future $4,000,000 home appliances plant.

Pacific States Steel Corporation, Niles, California, plans $2,000,000 expansion to include three 300 x 70 foot steel frame and corrugated iron buildings to house additional rolling mill equipment.

Miss Barbara E. Watson
of American Mail Line.

Woman Shipping Company Manager Sails

Miss Barbara E. Watson, a young woman who performs the important duties of California manager of the American Mail Line with headquarters in San Francisco has made many contacts with business interests of the Far East but she often wanted to visit the great ports on the coast of Asia and to witness their operations at first hand. Recently Miss Watson sailed from Seattle on the American Mail liner Island Mail en route to the Orient. Her Ports-O-Call will be Fusan, Korea; Manila; Hong Kong; Shanghai and Yokohama, and will make the round trip on the vessel.

Miss Watson was secretary to A. R. Lintner, president of American Mail Line, when he was Pacific Coast director of the War Shipping Administration with headquarters in San Francisco.

An official of the American Mail Line says that Miss Watson has the ambition plus what it takes in brain matter, to become an all-around transportation guy, and make it with honors; she has the commendation of the hard-boiled shipping higher-ups of the waterfronts of the Pacific Coast.

Worth B. Fowler
of American Mail Line.

Fowler Back With American Mail

Worth B. Fowler has returned to American Mail from government service and is serving in their San Francisco office. He was for five years with both the War Shipping Administration and the U. S. Navy in the United States, the Far East and Alaska areas.

Prior to Mr. Fowler's previous affiliation with American Mail Line, from 1940 to 1942, he served with the Quaker Line, both in their Seattle and Portland offices.

Mr. Fowler will remain in San Francisco for a short time and will then return to the main office of American Mail Line at Seattle.

Obituary

Funeral services for William A. Ross, president of Columbia Steel Company, West Coast Subsidiary of United States Steel Corporation, who died of a heart attack at St. Luke's Hospital in San Francisco, April 19, were held at his home at 2911 Lake Street, San Francisco, Tuesday morning, April 22, at 10:30 o'clock.

A native San Franciscan, Mr. Ross was born on December 8, 1878, and started his business career as an office boy in 1895 for the old Washburn-Moen Manufacturing Company, which was acquired shortly after by the American Steel and Wire Company. In 1911, the West Coast holdings of American Steel and Wire Company became the Pacic Coast Department of United States Steel Products Company, subsidiary of the United States Steel Corporation. Upon this consolidation, Mr. Ross was appointed Assistant Treasurer. He held various executive positions with this company until 1930, when the old Columbia Steel Corporation was acquired by U. S. Steel and Mr. Ross was selected to serve the new Columbia Steel Company as Vice President and Treasurer. In 1932, he was appointed Vice President and General Manager of Sales, in which capacity he served until his election to the presidency on September 1, 1939.

Mr. Ross is survived by his widow, Kathryn, and a sister, Mrs. John Van der Graoft, of Hollyburn, British Columbia. Interment was private at Cypress Lawn Cemetery.

Mr. Ross was a member of the Pacific Union Club, the Bohemian Club and the Family Club of San Francisco.

The late William A. Ross

GIANT FABRICATED CASING PUTS THE PAPOOSE BACK IN THE NEWS

ONE OF THE LARGEST FABRICATED DREDGE PUMP casings ever constructed was recently completed at Bethlehem Steel Company's San Francisco Yard for installation in the suction dredge, Papoose, built by the Yard in 1929 and owned by the Hydraulic Dredging Company, Ltd., of Oakland, This dredge has been described in several articles in the Pacific Marine Review. The new pump, weighing 42,000 pounds, was designed by the dredging company and is part of a modification program now being undertaken to convert the Papoose from a 20″ to a 30″ dredge.

Previous practice has been to use a heavy cast steel pump casing, perhaps as thick as 6″ and weighing twice as much, which acts as a strength member, and in addition takes the abrasive wear from the dredge material. At some indeterminate time, the casing, could fail, often with disastrous results. The ideal solution of fitting plate liners to take the wear requires a square corner on the pump casing which, while not impossible is a cast design, is more easily accomplished by fabricating from steel plate. Furthermore the saving in weight of the fabricated casing is of advantage to the dredge operator from the point of view of cost as well as from that of equipment weight which affects the freeboard of the dredge. In addition, the operator has a casing of known strength which is easily maintained.

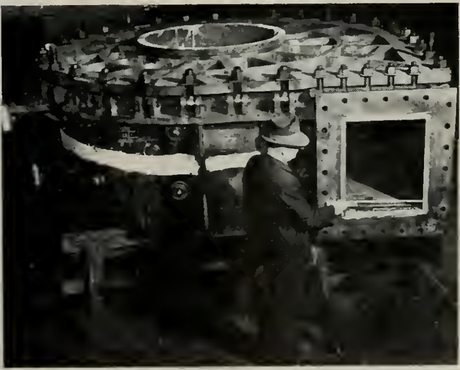
The fabricated pump casing for the Papoose is of the overshot type and is laid out as a modified spiral with a maximum inside diameter, excluding liners, of about 8′ 9″. The back of the pump is of 1¾″ mild steel plate with 6″ x 1¾″ radial and concentric stiffeners, while the wrapper plate is 41″ x 2″. The so-called "front door" of the pump is constructed of the same scantlings as the back and is of the drum head type which when removed clears the entire interior of the casing for liner maintenance. Hinged bolts attached to the wrapper plate drop into slots along circumference of the front door to secure it in place against a circumferential rubbed water seal.

The liners on the door and back of the pump casing are double, a ¾″ mild steel backing piece and 1¼″ high-carbon .60 carbon steel wearing member. The circle liner on the wrapper plate is a single 1¼″ high-carbon steel plate arranged in six easily handled scarph jointed sections. Gasketed studs through the casing hold the liners in place.

Because distortion tolerance caused by welding was limited in an effort to do away with expensive machining operations—such as facing off a bevel on the wrapper plate in way of the front door—skill was required in maintaining alignment of the heavy members. In effect the entire procedure was aimed at producing a machined finish by welding preshaped parts. In this Bethlehem's fabricating experts were successful. The entire casing was furnace stress relieved after fabrication.

This is not the first major job Bethlehem has performed on the Papoose since it was built. Late in 1944, when the dredge was taken over by the Navy, the San Francisco Yard increased the length of its digging ladder to enable it to dredge at the unusual depth of 100 feet. This was accomplished by cutting the ladder apart and inserting a 50-foot section. In addition, the hull was lengthened from 96 to 136 feet.

Because of experience it has gained in building 83 dredges, including the first successful gold dredge in America in 1897, and in repairing and providing replacement parts for all types of dredges ever since, Bethlehem's San Francisco Yard has been able to maintain a top position today in this type of business.



Giant fabricated casing for installation in the suction dredge, Papoose, built by Bethlehem Steel Company's San Francisco Yard.

Penn Flex Expands

The Pennsylvania Flexible Metallic Tubing Company of Philadelphia was stepped up in its program of direct service to its customers when it opened, on April 1, a complete branch headquarters in Los Angeles.

The new branch is under the supervision of Arnold J. Dovey, who has been a sales executive with the firm since 1939. His new territory will be from the Mexican to the Canadian borders, and as far east as Salt Lake City. The new unit, center of the Pacific Division of the company, is located at 30 S. Clarence Street. The branch is known as the Pacific Coast division of the Penflex Sales Company, sales organization of the Pennsylvania Flexible Metallic Tubing Company. The parent company was founded in 1902, and is one of the oldest U. S. firms manufacturing flexible hose for industrial uses.

The sales office and a large warehouse with a complete inventory on hand, makes up the new unit under Mr. Dovey's supervision. Dovey served with the Eighth Air Force from 1942 to 1946, in England. He holds the Distinguished Flying Cross and the Air Medal. He attended the Wharton School of the University of Pennsylvania and the Drexel Institute of Technology.

Arnold J. Dover of Pennsylvania Flexible Metallic Tubing Co.'s Los Angeles district head.

Federated Metals Launches New Trade Mark and Slogan In the Non-Ferrous Field

To bring to the attention of all who cast non-ferrous metals the details of the none-too-well-understood extent of its facilities, the Federated Metals Division of American Smelting and Refining Company has just launched a new trade mark and slogan which points up the surprising scope of the company's products, application-engineering work, research development, distribution network and technical-service facilities.

Federated
First in the
non Ferrous
Field
FMD

The new trade mark and slogan will be heavily accented in trade paper advertising, display, sales and engineering correspondence, and all other contacts with non-ferrous metals users—even to the extent of its use on delivery trucks, plant structures, and such. In connection with the slogan, it is pointed out that Federated's 11 manufacturing plants and 25 sales offices give the user closer and more versatile sources of supply; that the Federated line is complete for the non-ferrous foundry (embracing tin bronzes; yellow and red brass; manganese, aluminum and silicon bronzes; nickel silvers; aluminum, magnesium and zinc base alloys; lead alloys and lead products; solders and babbitts; type metals; and scores of others); and that Federated's metallurgical and research facilities are the most completely elaborated in the non-ferrous field.

Keep Posted

New Equipment and Literature for Yard, Ship and Dock

Engine-Life Products Corp. oil filtering equipment.

Engine-Life Products Oil Filter Element

Standard equipment for all types of lubricating systems is the new Engine-Life Oil Filter Element manufactured by Engine-Life Products Corporation, El Monte, Calif.

Engine-Life replacement filters consist of lint-free textiles wrapped in a closely knit muslin, pressure wound in convolutions around a perforated metal core, and covered with a heavy tubing or muslin jacket. The horizontal flow of oil from outside to inside through the laminated construction materially increases dirt and sludge removal. As elements absorb contaminants they expand, allowing greater dirt storage capacity and a higher saturation point than elements in metal containers.

These filters will not rob oils of their valuable additives, an advantage over earth-type elements. They may be used with any type of oil, regardless of its use or application. Replacement elements are available in 260 different sizes to fit all popular makes of filter cases. No adapters, springs, spacers or liners are necessary to make them fit.

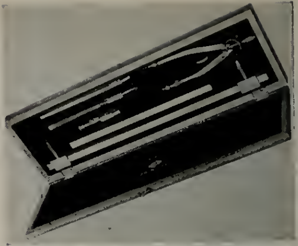
These filters are extensively used in diesel electric plants, in industrial applications, in machine shops for coolants and lubricating oils, in oil fields and pipe line equipment, for maintaining construction and mining equipment, for marine engines and pumps, farm power equipment and for hundreds of applications where dirt, grime and moisture in oil can result in a complete breakdown of engines.

Unusual Features in Bruning Drawing Set

New features and advantages are embodied in an industrial drawing set just introduced by Charles Bruning Company, Inc.

The instruments in the set consist of beam compass with 8-inch and 13-inch beams—a 6-inch giant Bow compass—ruling pen and club style wood handle and draftsman's refillable pencil that can be converted into a double point pencil.

An exclusive patented feature of the Bruning Beam Compass is a rapid, simple and positive adjustment of the needle and pencil blocks on the beam. A slight pressure of the thumb on the tension spring of the blocks allows the needle and pencil blocks to move freely and smoothly on the beam—yet release of pressure locks the needle and pencil firmly in desired position.



New Bruning drawing set.

Pipe Leak Clamp

A new all-purpose pipe leak clamp called the Patchmaster has been announced by Marman Products, Inc., of Inglewood, California. To the marine industry it offers a simple and effective solution to the ever present problem of pipe leaks caused by corrosion, wear and operational stress. It is well suited to the need for quick repairs under emergency conditions at sea as well as routine in-port maintenance. Repairs are permanent as a result of the extreme durability and resistence to corrosion of the clamp.

Pipe leak clamp.

The clamp is designed to stop leaks on low or high pressure pipe ranging in size from ½" to 4" in diameter. It consists of a corrosion-resistant, stainless steel Marman Universal Clamp and a specially designed patch plate of stain steel annealed sheet which naturally forms to pipe contour, and a Hycar oil-resistant pad. When installed and the clamp is tightened, pressure is brought against the pipe, positively sealing leak.

Patchmasters have been tested at 800 pounds per square inch without leaking. They come in four popular sizes to handle all pipe diameters up to 4 inches and can be used over and over without any efficiency loss. One clamp fits any pipe size up to maximum diameter of clamp.

New Paint Remover

A new, non-inflammable, fast-acting liquid paint stripper, marketed under the name of Paint-Zip, that easily and quickly removes paint, varnish, enamel and laquers from wood without raising the grain, also offers important new safety features, according to the manufacturer, Turco Products, Inc., Los Angeles, California.

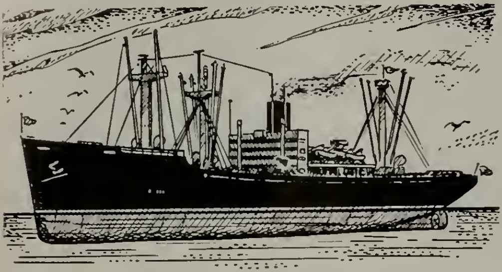
Removing old paint from a piano with new Turco remover.

Paint-Zip is non-inflammable, contains no abrasives and gives off no dangerous fumes. It is so simple to use that even an inexperienced operator can obtain uniformly satisfactory results. It may be applied by swabbing with a brush, with a spray gun, by the flow-on method or by immersion. Its action starts immediately. Most paints require about 5 minutes, while the most obdurate enamels loosen in not more than 15 minutes. Large sheets of paint are then peeled off and the remainder is quickly stripped off with steel wool or scraper. After wiping down with a rag soaked in Turco L-800, itself a mild paint stripper, all gums, films and residual matter are completely removed and the surface is immediately ready for re-painting without further processing.

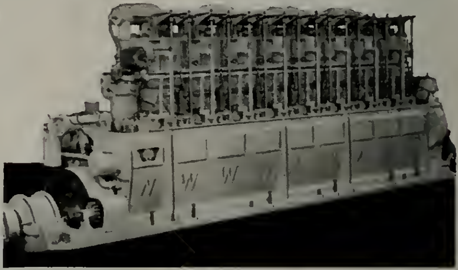
Paint-Zip may be used on vertical as well as horizontal surfaces. While it is especially recommended for wood because it positively will not raise the grain, it is equally effective for removing paints from all types of metals, since it will not cause oxidation or discoloration.

Improved Rodpak Announced

An improved floating seal metallic packing is announced by Rodpak Manufacturing Company. Improved performance and simplified construction distinguished the new product. Speedy and foolproof to install, it completely eliminates leakage without reducing the characteristic Rodpak flexibility. Its application to centrifugal or rotary units, insofar as installation is concerned, has been greatly simplified.




ATLAS
MARINE PAINTS
ANTI - FOULING
ATLAS PAINT & VARNISH COMPANY




SINCE 1882

PROGRESS

NOW, the AMEROID System of Complete Boiler Water Treatment also provides you with control over corrosion in steam lines, condensate lines, turbines, D. C. heaters, feed water heaters, economizers, and any other equipment through which steam, condensate and feed water circulate.

This *extra* protection is available at practically no additional charge with AMEROID Complete Boiler Water Treatment. Never before have such complete treatment and control been offered at such low cost.

And service costs you nothing
under the AMEROID no-charge service plan.

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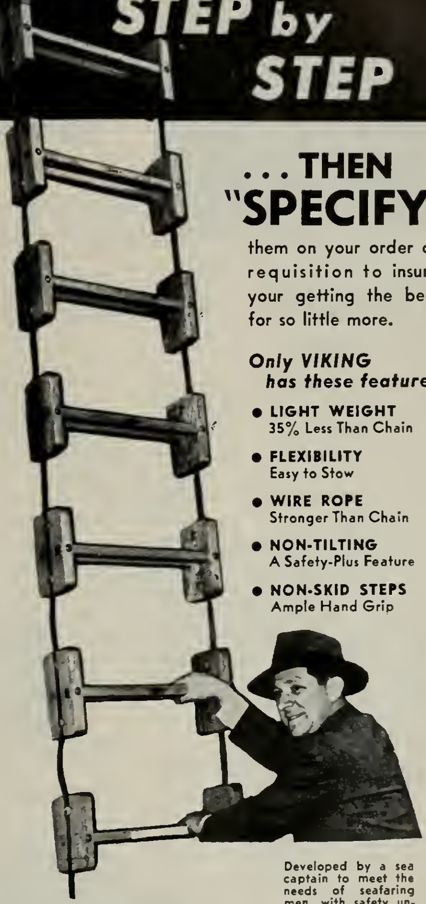
COMPLETE AMEROID SERVICE BY DREW ENGINEERS is available in principal seaports in the United States, Canada and Brazil.

For Safety's Sake

COMPARE "VIKING" NON-TILTING PILOT LADDERS

STEP by STEP



. . . THEN "SPECIFY"

them on your order or requisition to insure your getting the best for so little more.

Only VIKING has these features

- **LIGHT WEIGHT**
  35% Less Than Chain
- **FLEXIBILITY**
  Easy to Stow
- **WIRE ROPE**
  Stronger Than Chain
- **NON-TILTING**
  A Safety-Plus Feature
- **NON-SKID STEPS**
  Ample Hand Grip

The only government-approved wire rope ladder.

Developed by a sea captain to meet the needs of seafaring men, with safety under all conditions at sea . . . *But remember to specify —*

Viking
MARINE COMPANY

COLMAN BLDG., SEATTLE 4, WASH.

In California see **C. J. HENDRY CO.**
Wholesale Distributors

William Beck, president of Dahl-Beck

Ed Beck, manager of the firm.

A Half Century of Electric Service

The Dahl-Beck Electric Company, established originally as Herzog & Dahl, is another of San Francisco's pioneer firms serving the marine industry for over half a century.

Now located at Main and Mission streets, the firm became known as the Dahl-Beck Electric Company in 1932, when William Beck, shop foreman, became owner of the firm upon the passing of C. W. Dahl, one of the founders of the company.

The company has a well-equipped electrical and machine shop for the repair and rewinding of electric motors and generators, and carries a large stock of marine fixtures, fittings and cable for the marine trade.

During the war, under the direction of William Beck, president of the company and his brother Edward, manager, the firm greatly expanded its manufacturing facilities and its staff of workers manufacturing and installing special marine fixtures and fittings for the Army and Navy. More than two hundred workers were engaged in this work during the war period.

Back to a peacetime basis, the firm now has a highly trained organization for the sales and servicing of marine electrical installations and repairs, and motor and generator rewinding and repairing. Among the firms represented by the Dahl-Beck company are: Charles J. Henchel Corporation, Russell & Stoll Company, Weston Instrument Company, Delta Electric Company, Troy-Engberg Company, Westinghouse Electric Company, and Perkins Marine Lamp & Hardware Corporation.

Westinghouse Expands West Coast Executives

The Westinghouse Electric Corporation announces the appointment of R. A. Neal, vice president, formerly of Pittsburgh, Pa., as general manager of the company's Pacific Coast district operations.

This move in no way changes the duties or responsibilities of Charles A. Dostal of San Francisco, vice president in charge of Sales for the Pacific Coast district, or of others now in the company's employ in this district.

Appointment of a chief executive officer for the Pacific Coast, reporting directly to the President, is dictated solely by the expansion of the company's western operations, according to Gwilyn A. Price, Westinghouse president. The electric firm has just completed lease arrangements to operate the 57-acre Sunnyvale, California works formerly operated by the Joshua Hendy Iron Works. Other Westinghouse plants in the Pacific Coast District are located at Emeryville and Los Angeles, California; Portland, Oregon; Seattle, Washington; and Salt Lake City, Utah.

With Westinghouse 37 Years

Now in his 37th year with the company, Mr. Neal has been a leading figure in the development and manufacture of switchgear equipment, fostering improvements that have enabled power companies to meet the increasing demands for electric current at steadily decreasing consumer costs.

Recipient in 1937 of the Westinghouse Order of Merit, Mr. Neal was named vice president in May, 1944.

Robert A. Neal

Marine Insurance

(Continued from page 84)

looks on this war risk problem. One school of thought is in favour of the complete abolition of war risk insurance; another would retain the structure of the War Risk Insurance Office and would advocate the readoption of the Pool which operated before the war and by means of which the Government reinsured the market against King's Enemy Risks; a third school of thought would accept the gamble of transacting war risks insurance without any restrictions whatever.

Admiralty Decisions

(Continued from page 85)

damages for the alleged negligence because it had no contractual relation to or privity of contract with the defendant manufacturer. In the *Sieracki* case it was held that the action was for a maritime tort; therefore, the principles of law involved are those that are included within the general law of torts, maritime as well as common law.

The Steel Products Company argued that there is a doctrine or general rule to the effect that the manufacturer of an article is not liable for negligence in its manufacture to a third person with whom he has had no contractual relations: from time to time the requirements of justice have compelled the courts to make exceptions to this rule,—notably where human life and safety were concerned and the article or product is inherently dangerous; but, it is argued, there is no clear-cut case where an exception has been extended to cover property damage as distinct from personal injury, and they urged that the courts should be slow and reluctant to make another exception authorizing recovery for damage to property.

The Court answered the argument by stating:

> "I think the answer to that argument is that if we consider the rule as in force, and that this is a matter of enlarging the exceptions, there is no reasonable ground for making a distinction between injury to property and injury to the person. How can a general principle authorizing recovery of damages for the negligent act of another permit a man to recover for a sprained ankle and not for the destruction of his house? The real answer to the argument, however, is that the asserted rule relied on, though formerly widely followed, has shrivelled up and died in the light of modern reason and authority."

The Court relies upon the *MacPherson vs. Buick Motor Company* and cites a number of other cases that rely upon it and indicate their general acceptance of the principles announced in its decision. In the recent case of *Carter vs Yardley,* the Court summarizes the law as it exists today by saying:

> "Its acceptance has brought all dangerous things into the same class as the 'inherently dangerous' things to which the principle already stated has always been applied. The *MacPherson case* caused the exception to swallow the asserted general rule of nonliability, leaving nothing upon which that rule could operate. Wherever that case is accepted, that rule in truth is abolished, and ceases to be a part of the law.. * * *
>
> "In many recent cases that asserted general rule of nonliability to persons not in privity of contract has been denied, either in terms or in effect, and the principle stated earlier in this opinion has been applied. * * *
>
> "The time has come for us to recognize that that asserted general rule no longer exists. In principle it was unsound. It tended to produce unjust results. It has been abandoned by the great weight of authority elsewhere. * * *"

The motion of the Steel Products Company to dismiss the libel was denied.

With the Port Engineers

(Continued from page 71)

heavy oil is not competitive with the modern steam turbine plant in fuel economy. However, when operating with the heavier, less expensive fuels there is no question as to the diesel engine's superior economy.

In reviewing the maintenance problem, of modern marine diesel engines, the maintenance problems and costs have been shown to be far less than experience indicated for older designs. This is just one phase of economy of a modern diesel ship, and as long as we are discussing economy it might be well to talk about fuel consumption.

For the purpose of comparison, let us consider a modern steam propelled vessel and a diesel propelled vessel making a 15,000 mile run. Published average fuel economy of a Nordberg diesel propelled vessel, the Emory Victory with 6000 shp maintaining 15.5 knots, showed an overall fuel consumption of .39 lbs per shp per hour for all purposes and about 2.25 miles per bbl. The total fuel required for the above route of a little over 15,000 miles is 6800 bbls. or 990 tons. Similarly in service, a Victory type steam propelled vessel maintaining 15.5 knots shows about .6 lbs. per shp hour for all purpose and about 1.33 miles per bbl. average. This steam propelled vessel therefore will require 11,500 bbls. of fuel or 1770 tons. I used a weight of 7¾ lbs. per gal. for diesel fuel and 8¼ lbs. per gal. for boiler fuel. There is a saving of 780 tons of oil fuel in favor of the diesel, which means dollars in the pockets of the ship owner when converted into shipping tons, or by taking advantage of the savings in fuel a somewhat smaller ship can be built and still carry the same pay load.

The engines in the Emory Victory are designed to use heavy fuel oil and Pacific Specifications Number 300 is most suitable and can be obtained at San Francisco for $1.60 per bbl. and the cost of the fuel therefore would be $10,900 per trip. The Victory turbine ship using boiler oil at $1.40 per bbl. at San Francisco costs $16,200 per trip for fuel. In other words, the speeds being the same, 15-16 knots, the turbine propelled vessel would use 780 tons more fuel than the diesel, and the cost of fuel even with the price difference would exceed the fuel cost of the diesel by $5,300 per trip.

C-1 vessels, diesel propelled of 4000 shp, show in actual service 2.7 to 3.56 miles per bbl. against 1.26 to 2.07 for steamers of the same class.

Recognizing and acknowledging the fuel economy of the diesel, advocates the steam propulsion content themselves in the false doctrine that fuel economy is more than offset by the increase in lube oil required by the diesel. Let us analyze the situation and face the facts.

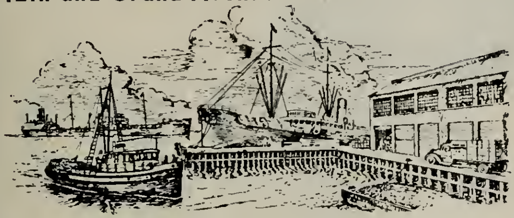
The Emory Victory on four long trips averaged 17.2 gals. of cylinder oil per day and 12.4 gals. of crankcase

(Please turn to page 136)

MARINE MARKETING COMPANY

S. L. (ROY) KUYKENDALL, General Manager and Partner

12th and Grand Avenues **SAN PEDRO** **CALIFORNIA**



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Representatives for

TODD COMBUSTION EQUIPMENT, INC.
(TODD OIL BURNERS)

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L. K. Siversen, Owner

THornwall 1636 **BERKELEY, CALIF.** **7th and Carlton St.**

TOUMEY ELECTRIC And ENGINEERING CO.

PILOT MARINE CORPORATION, New York, N. Y.
Signaling, Communicating and Lighting Equipment

BENDIX MARINE PRODUCTS

PNEUMERCATOR CORPORATION (New York)
Gauges: Liquid Level, Ships Draft, Pressure, Boiler Water Level

PLANT MILLS DIRECTION INDICATOR
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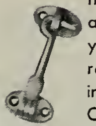
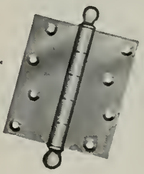
With the Port Engineers

(Continued from page 134)

oil per day for main and auxiliary engines, or a total of 29.6 gals. This means on a typical 15,310 mile voyage at 15.5 knots average speed, taking approximately 100 days, the Emory Victory would require a total of 1720 gals. of cylinder oil and 1240 gals of crankcase oil for this trip. Assuming a price of $.50 per gal. for cylinder oil and $.40 per gal for crankcase oil, this would total $1356 per trip. Deducting this from the $5,300 saving in fuel cost still gives us an overall saving of $3,940 per trip without even deducting any cost of lube oil for the steam propelled vessel. The statement that diesel fuel economy is offset by increased lube oil requirements is without basis.

Most major repairs can be prevented by systematic maintenance and examination. This is ecpecially important on oil tankers and coasters where a quick turnaround is required. A good plan is to break the engine up into units and overhaul one unit per trip. A unit should consist of one complete cylinder, including piston, cylinder head, bearings, fuel injection pump and nozzle. A complete spare unit is onboard. Why not use these parts to their best advantage instead of leaving them fastened to the bulkhead getting rusty? When overhauling a unit, pull the piston and install the spare, change the fuel pump, cylinder head with its nozzle, starting valve and relief valve. Open up the connecting rod bearing, if it looks satisfactory close it up, if not, install a spare shell. All of this can be done in one working day. Then, when you're out at sea, clean up and overhaul the parts you removed from the engine and get them ready for the next unit overhaul. On this basis you can maintain your diesel in one working day per cylinder for service and one working day per cylinder for the cleaning and overhauling of the parts you removed from the engine. Follow this procedure every 3000 to 5000 hours running time and there will be no need for major overhaul.





Steamship Accounting

(Continued from page 67)

The pegboard form is especially convenient for voyages, because it makes readily possible a consistent comparison between any given voyage of a vessel, on the one hand, and on the other hand, other voyages of the same vessel, or similar voyages of sister ships, or any other voyages with which comparison may be useful.

It might be thought logical from what I have said about operating-differential subsidy, that subsidy earned would be deducted from the specific vessel expense accounts on which the subsidy was calculated. As a matter of fact, it has been found more convenient to calculate voyage profit on actual revenue and gross expense, and then to add to the voyage profit thus calculated the amount of the subsidy, giving rise to a new amount of voyage profit after subsidy. This method has been crystallized by its inclusion in the standard system of accounts established by General Order 22 of the Maritime Commission.

Charges Against Voyage Profits

Up to recent years the depreciation taken by steamship companies and recognized by the Treasury Department usually ranged between 2 per cent and 4 per cent, except for tankers and other vessels which carried corrosive cargo. The Merchant Marine Act of 1936 requires for its purposes that depreciation on vessels be calculated at 5 per cent of cost less a small arbitrary residual value. That residual value is 2½ per cent of original construction cost. Probably 4 per cent comes nearest the rate which experience in this and other nations has shown to be a safe and appropriate average. The Merchant Marine Act was designed to err a little on the conservative side so as to call for earlier replacement of vessels which may not have worn out but which may have become obsolescent by comparison with vessels under other flags.

General and administrative expense, the principal element of overhead, differs little in a steamship company from the same expense in other industries. The Maritime Commission, however, requires subsidized lines to treat all fees for agency services performed for other lines, and all commissions and brokerage earned, as a deduction from general and administrative expense instead of being carried as an additional form of revenue.

Advertising and interest expense are accounts which differ in no respect from similar accounts in other industries. Although a steamship company usually has mortgages against individual vessels, the interest cost is nevertheless not included in computing the voyage profits of those vessels. This is sound because for no reason related to earning power one vessel may be heavily mortgaged and another lightly mortgaged, while at some other date the borrowed capital may be nonexistent or held instead on an unsecured bank loan.

Steamship company taxes differ greatly from those of a manufacturing or trading company. Deep sea vessels, because of their location, are usually not subjected to a property tax at all. Furthermore, in order to encourage investment in an industry which was not attractive in former years, and which had been the victim of changing and uncertain government policies, Section 607(h) of the Merchant Marine Act of 1936 provided that "the earnings of any contractor receiving an operating-differential subsidy under authority of this Act, which are deposited in the contractor's (Capital and Special) Reserve Funds . . ., except earnings withdrawn from the Special Reserve Funds and paid into the contractor's general funds or distributed as dividends or bonuses . . ., shall be exempt from all Federal taxes." Accordingly, you may see tax charges in steamship company statements at times lower than you would otherwise expect.

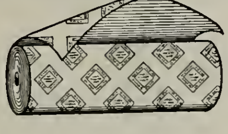
Offshore steamship companies do have considerable difficulty with income taxes in foreign countries. It has been generally recognized by those engaged in international trade that taxation of international carriers should be confined to the nations to which the respective carriers belong. Some progress in this direction has been made by way of treaties, and our Department of State has in hand the matter of negotiating similar treaties affecting other nations and colonies. Of course American steamship companies, like all other American companies doing business in foreign countries, may deduct from their United States income tax an amount actually paid in income tax to a foreign country, to the extent that such tax does not exceed the amount which would otherwise have been payable on the same income to the United States.

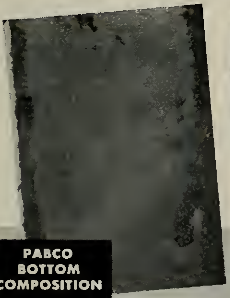
Certain Debits and Credits to Surplus

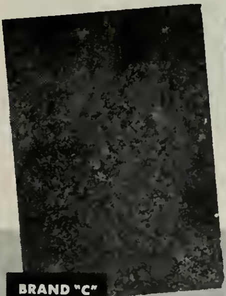
After arriving at net income, there are still two items which will appear on a subsidized steamship company's operating statement which are peculiar to such a statement. The first is composed of debits and credits to surplus on account of transactions of former years. It is considered good practice for most non public utility companies to absorb in the current year's income statement small adjustments and newly discovered or determined items which pertain to prior years, leaving only large or otherwise significant items to be set forth separately as surplus entries. This is not true under the Maritime Commission's General Order 22. The subsidy accrued and the subsidy recapture accrued are required to be corrected and adjusted almost indefinitely for all items above very low maxima, and therefore you will find surplus adjustments prevalent in subsidized steamship company reports.

The other item likely to be found in the surplus account of a subsidized steamship company is an amount carried to subsidy recapture if the earnings from subsidized operations were more than 10 per cent on "capital necessarily employed" (as defined and determined by the Maritime Commission), and an amount carried into surplus from the subsidy recapture liability if such earnings were less than 10 per cent *and* if there is previous provision for subsidy recapture on which to draw. Subsidy recapture is computed cumulatively, and settlement occurs at the end of every ten years during the life of the operating-differential subsidy contract.

(To be concluded in our June issue)







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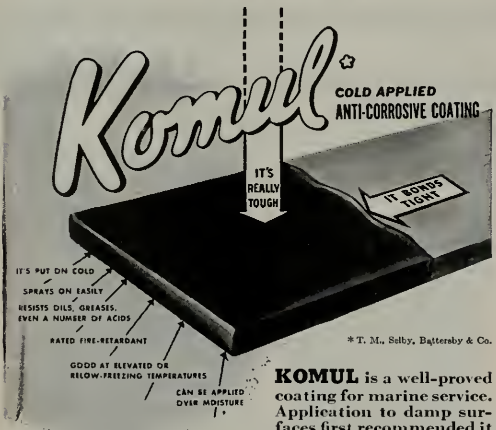

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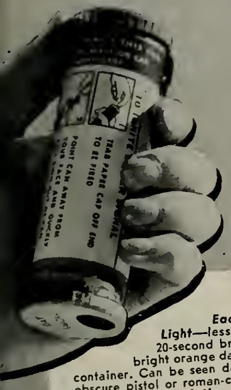

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Bringing Radar to the Deck Officers

(Continued from page 89)

indicated by electronic marker-circles on the face of the screen. The equipment employed by Standard is capable of being set on a 1½, 5, 15 or 50-mile scale. Under normal operations at sea the 15 and 50-mile scales are employed but the 1½ and 5-mile scales are also used at sea for close navigation as well as in restricted waters.

The Mariner's Pathfinder radar is extremely simple to operate, there being only five controls which are ordinarily used by the navigating officer. To place the radar in operation, the main power switch on the indicator panel is turned to the "on" position. After a time delay of approximately three minutes the radar is ready for operation, this three minute delay is automatically provided by special time delay relays which apply proper operating potentials to the various units in the proper sequence. At the end of this delay period there will appear on the indicator screen a radial trace which will extend from the center of the screen to its outside edge, and to adjust this trace for proper operation it is merely necessary to turn the "gain" control fully counter-clockwise and then with the "intensity" control the radial trace is adjusted until it is a faint, sparkling line. The range switch may now be operated to select either the 1½, 5, 15 or 50-mile range With the antenna switch thrown to the clockwise rotation position, the radial trace will then begin to travel in a clockwise direction and the receiver "gain" control should be increased until the background of the screen becomes light in appearance and the targets will then stand out, or the gain may be adjusted to any sensitivity for some particular observation. If it is desired that the distance from the ship to any target be known, the "marks" control may be advanced until the concentric marker rings appear on the indicator. These rings appear equi-distant at intervals on the indicator, on the 1½ mile range three markers appear, the first one one-half mile from the ship and the other two one-half mile from each other; on the five mile range these marks are one mile apart; on the fifteen mile range the marks are three miles apart and on the fifty mile range they are separated by ten miles. The range of any target may be accurately determined by its distance from the range mark to which it is closest. When operating the radar on "relative" bearings the azimuth of the target is obtained by rotating the "bearing crank" until the cursor bisects the target and the bearing is read directly from the inner dial. If the ship is equipped with a Sperry gyro system which is connected to the radar, it is then possible to have the targets appear on the screen with true north always vertical, or by throwing a switch on the radar indicator the targets can be shifted to "relative" and in this mode of operation the ship's head is always pointed toward "zero" on the inner scale. True bearings may be read while using "relative" operation by rotating the Ritchie ring until the ship's heading is at zero on the inner scale, then when the cursor is aligned with a target the inner scale will read "relative" bearings and the outer scale will read true bearings. The position of the ship's head is always indicated by a flash of light extending from the center to the outside edge of the screen so that when operating on "relative" bearing the "ship's head flash" will always extend from the center of the screen vertically to zero on the inner scale and when operating on "true bearing" the head flash will extend from the center of the screen to the true heading of the vessel as read on the inner scale. If the vessel is at sea and no targets are within range, it is possible to check the performance of the radar by shifting to the 1½ mile range, advancing the gain control to near maximum and then depressing the "performeter" switch and four to six spoke-like patterns will appear on the screen and if the radar is operating properly these spokes will extend out about 1,000 yards. If there are heavy seas running which tend to obscure the targets, the condition may be corrected and this interference eliminated by changing the "sea return" switch from the "normal" to either position one or two.

The Floating Drydock

(Continued from page 73)

its own buoyancy and lifts the ship above the surface of the water.

The floating drydock shown in the accompanying photographs is of the solid trough type in 3 sections, having a 22,000-ton capacity with 12-inch freeboard. Each pontoon has a water tight buoyancy chamber for the full depth of the pontoon and extending the entire length of each pontoon section. The dock is 654 feet long and 100 feet wide inside the wing walls. It has 16 water tight compartments which can be filled or emptied individually so ships of different sizes can be handled. The dock is self-docking in that the end sections can be detached and used to raise the center section and the center section used to dock the end sections.

This dock was built by Bethlehem in 1943 at its Fabricated Steel Construction Division in Alameda, now operated by Bethlehem Pacific Coast Steel Corporation. The dock was launched in 3 sections from 80 sand-filled metal cylinders which were burned off in sections at low tide until the bottom of the dock was at an elevation of approximately 8″. The rising tide floated the dock off these sand jacks, as they were called. This was the first time such a launching procedure was ever employed and proved highly successful. It was worked out by Bethlehem engineers. The sand jacks, consisting of steel cylinders made from 15/16″ plate with an inside diameter of 2′ 4″ and 10′ 5″ to 17′ high depending on their location under the dock, were supported on timber piles and caps and were braced together in groups of 4 for lateral stability. At the upper end was a plunger or moving part of the jack. This was supported on the sand fill in the steel cylinder and consisted of an ⅛″ shell plate with a ½″ bearing plate on the bottom and filled with concrete. Lowering the dock was done in a series of 1″ steps, all jacks being brought down the same distance before starting the next steps.

Before a ship is drydocked the Hull Department prepares a docking plan which gives necessary dimensions and other characteristics of the ship to aid the dock master in properly fixing the location and heights of the foundation blocks on the dock. The dock is then lowered

(Continued on page 146)


VIKING PUMP CO.

Glenn W. Malme, Western Gear Works.

Malme Now Sales Promotion Manager for Western Gear Works

Glenn W. Malme, formerly advertising manager for Southern California plants of Western Gear Works has been advanced to the position of sales promotion manager for all three plants of Western Gear Works and Pacific Gear & Tool Works, according to an announcement made by S. L. Crawshaw, manager of Sales & Engineering. Malme has been with Western Gear for the past five years and now will handle all advertising and sales promotion activities for the three plants. Botsford, Constantine & Gardner will continue to serve as advertising agency. Malme will retain his offices in Los Angeles. Western Gear Works has plants in Seattle, Los Angeles and San Francisco and is the largest manufacturer of gears and gear products on the West Coast.

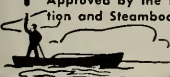
McCune Back from Navy Service

ROLAND E. McCUNE of the McCune Merifield Company, 51 Fremont Street, San Francisco, started in business in 1930. In 1932 he joined with John B. Merifield in forming the present company which represents important manufacturers in the marine hardware and sporting goods fields.

McCune handles the San Francisco and Los Angeles branches and also the Hawaiian Islands territory. Merifield takes care of the Seattle office from which all Western Canada and Alaska territory is handled.

McCune's marine experience includes twelve years with the Bethlehem Shipbuilding Corp., San Francisco, and three years with the U. S. Navy Bureau of Ships, as Lieut. Commander in the recent war. Merifield saw service in U. S. Army in World War I, retiring with the rank of Major.

Roland McCune



Above: The trim, 110-foot Cherokee is shown as she recently left the Moon Shipyard at Norfolk after being prepowered with a new 275-hp direct-reversing 6-cylinder Cooper-Bessemer diesel.

At right: This is the new 275-hp direct-reversing supercharged Cooper-Bessemer diesel. Note the lifting gear which is provided by the company for all marine installations to provide for safe and easy handling.

Repowers Trawler Cherokee With Cooper-Bessemer Unit

The fishing trawler Cherokee, repowered with a new 275-horse-power direct-reversing, 6-cylinder supercharged Cooper-Bessemer diesel, has resumed her fall and winter activities along the Virginia Coast as one of the triumvirate of Captain B. F. Forrest's East Coast fleet.

The Cherokee, a trim 110-footer, is capable of a speed of 13 miles per hour and is equipped with a Columbian Type MI, three-blade 56 by 42 wheel. It was purchased by Captain Forrest in 1940 from the Government which had built it originally for sub-chaser service. Considerable rebuilding was necessary, including replacement of frames and planking. She was christened early in 1941 by the former Miss Katherine Myers, of Portsmouth, Va., who now is Mrs. B. F. Forrest.

The new engine was installed at the Moon Shipyard and Repair Company, of Norfolk, under the supervision of L. B. Hume and George Lyon.

Other members of the Forrest fleet include the Manchonoch and the Whitestone.

The Floating Drydock

(Continued from page 142)

and the ship, aided by tugs, is directed in bow first. As soon as the bow comes in line with the dock, breast lines are thrown aboard port and starboard and made fast to bits. The haul-in line is then attached to a capstan on the dock and a holding line made fast to the port side. When the ship has progressed far enough in the dock, after-breast lines are thrown aboard and made fast.

All during this drydocking operation, a drydock engineer in the operations control center booth located ashore at the head of the dock directs his gang of dock hands by means of a public address system. He is also in telephone communication with the two operators in the drydock control house who regulate the valves and pumps in aligning the ship in docking position. When the ship is in proper position above the blocks, docking lines are made fast and the dock is raised.

Besides the 22,000-ton floating drydock herein described, Bethlehem's San Francisco Yard operates three additional floating drydocks of the following capacities: 16,000; 11,000 and 6,500 tons.

Japanese Merchant Fleet Wartime and Postwar Control

(Continued from page 60)

became luxuries which the beleaguered Empire, faced with disaster, could no longer afford. The bitterly jealous Army and Navy could consent to work together and to cooperate with the despised civilians only as a last act of despair. The fact that they now did so shows the measure of their desperation.

The dual system of separate military and merchant shipping was abolished in May, 1945, and all shipping of every type placed under the control of a unified General Headquarters of Shipping, a part of Imperial General Headquarters. Here, centralized government control reached its tragic peak. The private operators had been absorbed into SCA and now SCA was in turn absorbed into one over-all shipping command. Under it, all vessels, shore staffs, port facilities, and seagoing or shoreside personnel were placed on a military basis, subject to military discipline. Allied landings were expected at any time and every vessel was needed for maximum use. Civilian port labor, stevedores and shipyard workers were replaced by Korean and Chinese slave labor, prisoners of war, and, finally, even by Japanese Army personnel.

Whether or not this last system could ever have succeeded will never be known, because it had scarcely begun when the war came to its thunderous and dramatic close—the great fire raids and fleet bombardments, the carrier-plane strikes up and down the Inland Sea, then Hiroshima, Nagasaki, and, finally, the voice of the Emperor himself, broadcasting, for the first time, directly to the people on August 15, 1945.

After the surrender, the Imperial General Headquarters, of which the General Headquarters of Shipping was a part, was dissolved and control of shipping reverted back to SCA under the Marine Bureau of the Ministry of Transportation. It was SCA that prepared the inventory of the remnants of the Japanese Merchant Marine for submission to the Supreme Commander for the Allied Powers as required in General MacArthur's General Order No. 1.

(The conclusion of this article, with tabulations showing the totals by number, route and tonnage of the Japanese merchant fleet from 1930 onward, will appear in the June Pacific Marine Review.)

Pacific
MARINE
REVIEW

JUNE 1947

KNOW YOUR *House Flags*

The American Merchant Marine's long and splendid record of achievement is a reflection of the energy and ambition of its leaders. Here, in this second of a series, are seen the house flags of more great organizations with home ports on the Pacific Coast. Serving these, and many other maritime interests around the world are General Petroleum Corporation and other Socony-Vacuum companies, that supply Gargoyle marine oils and helpful lubrication service.

OLYMPIC STEAMSHIP CO., Inc.

Olympus was the home of the Greek gods, and in the Northwest the snowcapped Olympic Mountains are a symbol of everlasting strength. This red, white and blue flag is truly international and indicative of the world-wide activities of the American Merchant Marine.

NORTHLAND TRANSPORTATION COMPANY

Representative of the Northland's never-setting summer sun is the gold "N" on a field of blue. Since 1925 this flag has flown on the fleet of Northland Transportation Ships that serves Southwest Alaska with regular weekly sailings.

PACIFIC FAR EAST LINE, Inc.

The Grizzly Bear is a familiar figure in California history and also has a place in the symbolism of the Orient. Thus the orange and blue bear of Pacific Far East Line's flag is peculiarly appropriate for this new company in the Transpacific trade.

JAMES GRIFFITHS & SONS, Inc.

The house flag of James Griffiths & Sons was designed by the late Captain James Griffiths, founder of the company. It's British origin is appropriate to the firm's operations between British Columbia and Central and South America, as well as other trade routes.

SOCONY-VACUUM OIL CO., Inc.

The Flying Red Horse of Socony-Vacuum and General Petroleum is well known in every country of the world except Russia, and is recognized by seafaring men as a symbol of outstanding service and products. In addition to its own fleet of tankers, Socony-Vacuum companies have marine station facilities in more than 300 ports, for the distribution of Gargoyle Oils and Lubricants.

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Today once more the famous Tubbs Extra Superior Manila Trademark is back to assure you of the rope recognized as the outstanding leader in the West.

Tubbs Extra Superior Manila Rope is stocked by leading suppliers in the marine field. Insist on the brand name — Extra Superior Manila.

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By T. Douglas MacMullen

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Running Lights—
By B. H. Boynton

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Pacific
MARINE
REVIEW

CAN THESE THINGS BE!

IT IS SAID THAT TWO CHINESE CHARACTERS represent the word "crisis." One is the character for danger; the other, opportunity.

The danger that develops when progress is halted has been hovering over the Maritime industry for some time. But opportunity has been there too.

We hear on various occasions that America is the "last bulwark" against this or that, the "last frontier," etc., etc. Can it be so blithely overlooked that we are first, not last, in almost everything the world holds dear? Even in shipbuilding we have not seen the "last" of construction, but are just approaching the *first* of a long series of new vessels, which may well be the world's best, for they will be the right ships for the respective trades. The crisis, brought about by construction stoppage, contributed to the opportunity.

There was a trend in the prewar days toward other flags. A consular official, speaking recently in San Francisco, reported having spent five years in Aden, and two years in Colombo, during which no U. S. flag ship visited those ports. May it not be that we will soon be back on all the world's trade routes? It is estimated by the Maritime Commission that by 1950 seaborne commerce will reach the equivalent of 29,000 shiploads, and the Department of Commerce figures that in this year, 1947, U. S. exports and imports will reach 25 billion dollars. This is more than double the 12 billion estimate of postwar business made just two years ago. Opportunity is just ahead.

And the shipping and shipyard crisis has developed other possibilities which seemed unthinkable a short time ago.

One of these is a greater public understanding and interest in the industry. The President's Advisory Committee is a product of this awareness.

Another is industrial groups and Chambers of Commerce recognizing the vital part the industry —and world trade—play in community welfare.

Another is the admission by labor of the need for economy and discipline in ship and cargo handling.

Another is the official approach to the railroad freight rate problem; and to the sea-air problem.

And there is even an official suggestion for a 50 per cent reduction in Panama Canal tolls.

Can it be that all these great needs are approaching accomplishment? The Pacific Marine Review has carried editorials urging all of them and believes that these and many other crisis-born opportunities will be embraced. Crisis and opportunity are indeed linked together in the maritime industry. A united industry has within it the elements that make for accomplishment. It should not take a crisis to bring them together, but there is satisfaction in knowing that at the approach of crises, opportunity will also appear.

Albert V Moore President
Moore McCormack Lines, Inc.
◄

Emmet J McCormack vice
president Moore McCormack
Lines, Inc
►

THE RECONVERSION OF THE "GOOD NEIGHBOR" FLEET

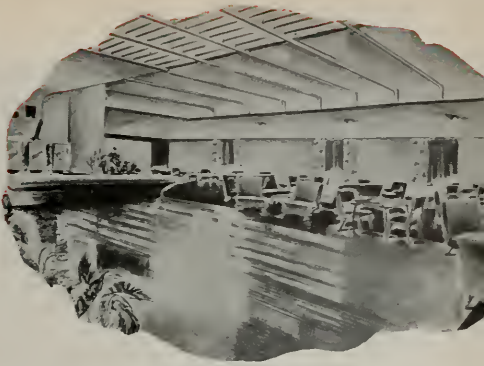
SLATED TO MAKE THEIR FIRST POSTWAR CIVILIAN VOYAGES to the East Coast of South America this summer, the three "Good Neighbor" ships of the Moore-McCormack Lines are now undergoing extensive repair at East Coast shipyards. The three ships, when finished, will be completely rebuilt and modernized in every respect, with new equipment and modern design pointing toward passenger comfort. The rehabilitation work is being accomplished on the Uruguay in the Federal Shipbuilding and Dry Dock Company yards at Kearny, New Jersey; on the Brazil at the Atlantic Basin Iron Works in Brooklyn, New York; and on the Argentina in the Bethlehem Steel Company yards at Brooklyn.

K C Tripp West
Coast manager
Moore McCormack
Lines, Inc

The operators were eager to have the ships return to their old runs earlier in the year, but delay in delivery due to extended use as troopships disrupted the reconversion schedule. Plans and specifications for the work on the Uruguay and Brazil were made by the firm of Joslyn and Ryan, naval architects and marine engineers of San Francisco, and the interior decoration is being engineered by the W. F. Schorn Co. of New York. Those for the Argentina were by Gielow of New York.

The three ships were built by the Newport News Shipbuilding and Dry Dock Company of Newport News, Virginia, the Uruguay being launched as the twin-stacked California for the Panama Pacific Line. She was placed on the coast-to-coast run via the Panama Canal in February, 1928, to be later joined by her sisters: the Virginia, launched in November of 1928, and the Pennsylvania which slid down the ways in October of 1929. The California was slightly shorter than the other two and was registered with less measurement tons to her

ng salon



Main Lounge

credit, but in all other respects the ships were identical. In principal characteristics the California had a length overall of 601 feet as compared to 613 feet for the Virginia and the Pennsylvania which were classed as measuring 20,614 gross tons as against 20,183 gross tons for the California. The ships had a moulded beam of 80′-0″ and a loaded draft of 34′-4″.

Turbo-Electric

From the mechanical angle, the three sisters were somewhat of an experiment. All American passenger liners of any size up to the building of the Panama-Pacific boats had been propelled either by reciprocating engines, direct drive turbines or geared turbines. Following the Navy's experience, the new steamers were designed with turbo-electric drive. Although slightly less efficient than the geared turbine drive, this type of pro-

Typical stateroom

pulsion unit is not under the great strain which is present in geared turbines during maneuvering. The turbines were built by the General Electric Company and the generators and main propulsion motors are of the same manufacture. Alternating current is employed on the electrical end of a voltage of 3700, the motors driving twin screws. The total output of the main power plant is 17,000 horsepower for the two units which are capable of driving the vessels at a cruising speed of 18½ knots.

Again, as in hull particulars, there were slight differences in the mechanical end of the ships. The boiler pressure carried by the California was 275 lbs. per sq. in., whereas the pressure carried in the Virginia and the Pennsylvania was 300 lbs. per sq. in., the latter two ships having two fire rooms containing four B-W boilers each. The California had twelve Babcock-Wilcox boilers, six in each boiler room, and all ships were equipped with force draft blowers.

The early mechanical success of these ships caused an increase in popularity of the turbo-electric drive for passenger liners. The Dollar Line followed the example of the Panama-Pacific ships in the design of the President Coolidge and the President Hoover. This type of engine proved to be practically vibrationless, which not only speaks well for its great efficiency but rendered the type ideal for installation on passenger liners where the comfort of the traveler is of the highest importance.

With accommodations for 400 first class passengers and 350 tourist class, the ships carried on a lively trade in both passengers and cargo for a period of about seven years on the New York-San Francisco route. Unfortunately for the operators, the period of operation embraced the worst years of the economic depression and revenues fell off so appreciably that the line ceased to be profitable.

The newly formed United States Maritime Commission took the three vessels in 1936 and redesigned them,

Modern interiors above include the main lounge, the cocktail lounge, and portion of the dining salon.

THE ARGENTINA WILL BE READY TO SAIL JULY 25, AND THE URUGUAY SOME TIME BETWEEN AUGUST 8 AND AUGUST 15. SAILING DATE FOR THE BRAZIL HAS NOT YET BEEN SET.

SS Uruguay in Federal Shipbuilding & Dry Dock Yard, Kearny, New Jersey.

assigning them finally to the American Republics Line in 1937 to operate in the South American trade. It is to this design that the ships are now being restored, as many noteworthy changes were made at that time, the most prominent of which was the removal of the two stacks and the substitution of a single, larger funnel. The boats were then rechristened, the California becoming the Uruguay, the Pennsylvania being renamed Argentina and the Virginia taking the new name Brazil, the names being chosen because they represented the names of the South American countries in which lay the ports of call of the Republics Line in the Southern Hemisphere.

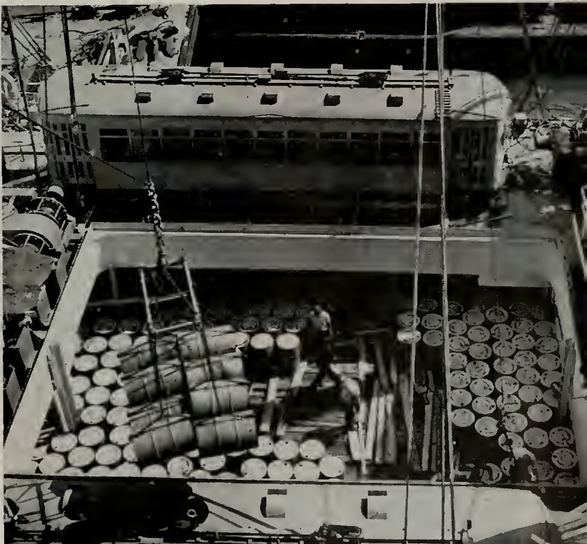
The steamers in their new role were known as the "Good Neighbor Fleet", and as such they were acquired by the Moore-McCormack Lines on January 1, 1939 when the American Republics Line was turned over to the Moore-McCormack interests.

The Moore-McCormack Lines is a pioneer in the South American trade. The company was established in 1913 when Albert V. Moore and Emmett J. McCormack began maritime operations with the chartered steamship Montara which made her first run for the partners to Brazil. Their successful operations in this trade, aided by the opportunities afforded during World War 1, encouraged them to increase their South American service and augment their trading to American coastwise and Baltic Sea routes. When the firm acquired the "Good Neighbor Fleet", many regarded the move as a foolish one, observers feeling that the South American passenger run would prove to be definitely a financially unsuccessful one. However, passenger revenues proved otherwise. In 1937, only 7,500 passengers traveled on the ships for the American Republics Line, but in the first year of Moore-McCormack operation, 1939, 15,000 persons rode the vessels. And in 1941, despite the fact that the season was cut short by threats of war and that the U. S. Maritime Commission took the ships to turn them into troop carriers, the original passenger lists had trebled, and the travel was not confined to persons from the Northern Hemisphere traveling South of the Equator for a pleasure cruise. The South Americans, being served for the first time by luxurious passenger liners from the United States, booked passage for both pleasure and business, and the name "Good Neighbor Fleet" became justified.

During the war the ships were stripped of their fine interior decorations and furnishings, and without any of the prewar polish transported roughly 1,000,000 men to all theaters of war, and 20,400,000 tons of cargo besides. And now once more released to their owners for civilian travel, restoration to peacetime glory is the first item on the docket. The conversion of the three ships will follow pretty much the same plans, but we will base the following on the Uruguay and Brazil.

The conversion involves not only restoration to the former elegance of the ships, but also includes many additions and great changes in style of interior decora-

Care as well as speed marks the handling of freight (*above*) . . . every precaution is taken to protect shipments . . . *Below:* Bulky deck cargo as well as vast hold shipments are easily handled by these large ships.



Broad Sports Decks surround spacious tiled swimming pools, inviting full enjoyment of out door cruise fun ►

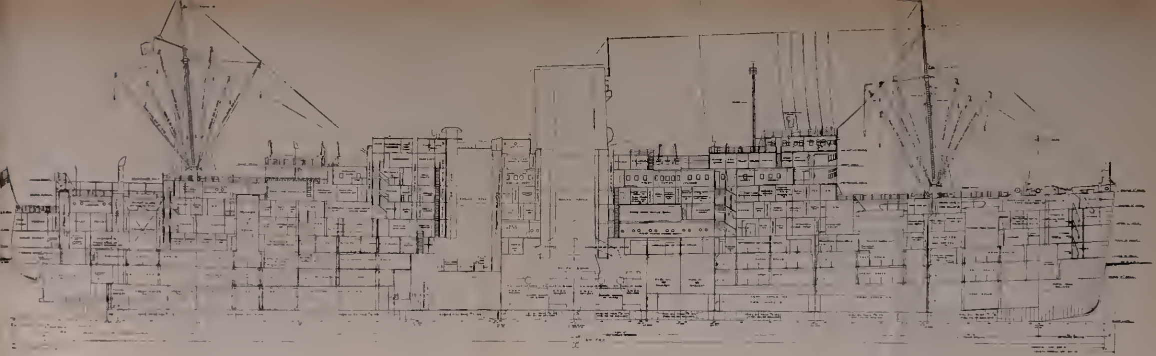
Large and handsome state rooms, smartly decorated, surround the traveler with an atmosphere of gracious hospitality enhanced by service of the highest order. ►

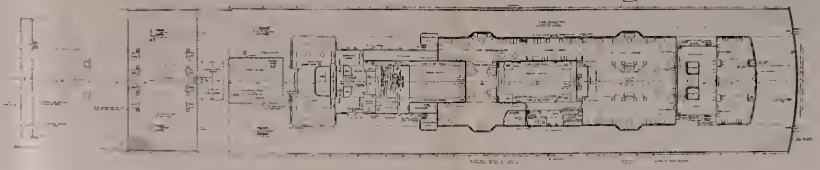
tion. Structural members which are damaged, corroded or worn are being replaced, and all bulkheads and decks are being restored to their original condition. All tile or magnesite decking is being torn up and the plating underneath drilled and inspected for thickness. All steel, including hull plating is being scraped to bare metal and wirebrushed, and where the metal is reduced in thickness as much as 15 per cent, new steel is used to replace it. All bent or damaged hull plates are being straightened or renewed and all rivets tested for tightness.

The main galley and all its auxiliary compartments are being completely overhauled, and new Hotpoint and

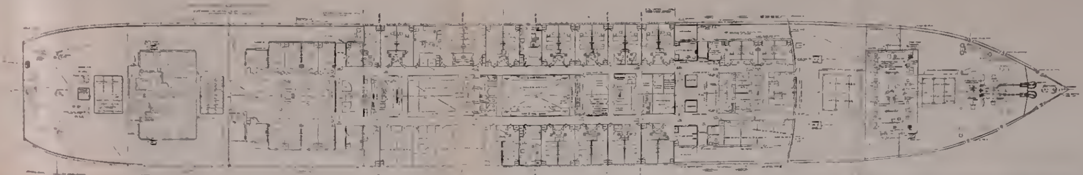
	Uruguay (California)	Brazil (Virginia)	Argentina (Pennsylvania)
Length O.A.	601	613	613
Beam	80	80	80
Draft	34′4″	34′4″	34′4″
Displacement	33,000 approx. for each		
Gross tonnage	20,183	20,614	20,614
Passengers (each vessel)			359 1st Class 160 tourist
Crew (each vessel)		407	

(Prewar was 475 passengers, 380 crew)

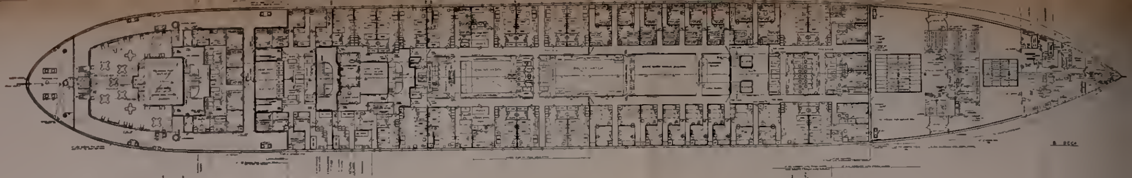




PROMENADE DECK



A DECK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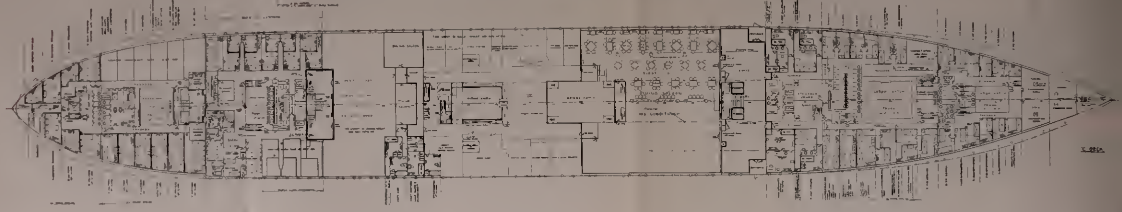
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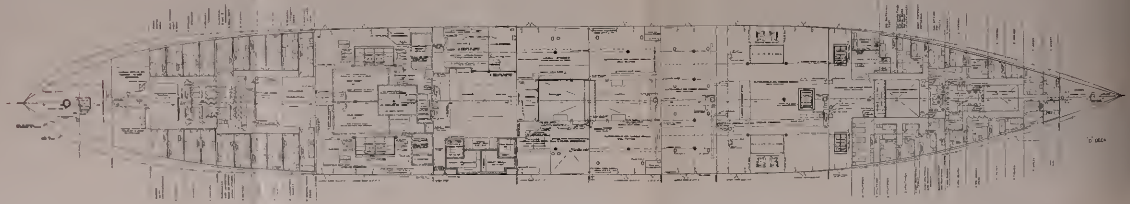
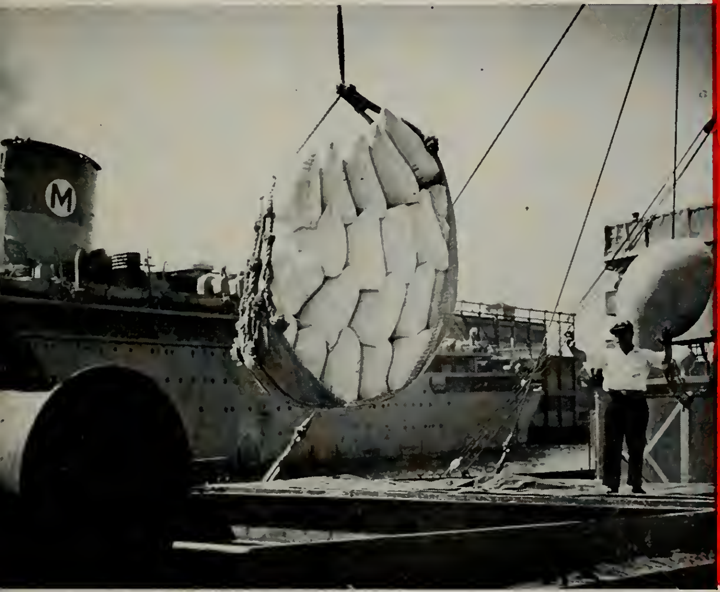

'D' DECK


'E' DECK

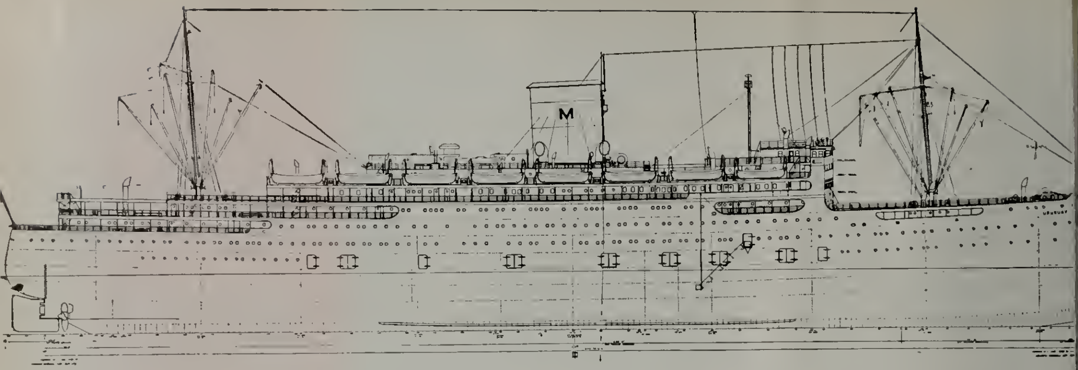
Ambassadors of Trade, as well as spacious passenger carriers the "Good Neighbor" liners carry large shipments to and from South America.
◄



With coffee, wool, waxes and other riches produced by the "Good Neighbor" lands the Ambassadors of Trade return from below the equator with rich cargoes.
◄

Hobart galley equipment is being installed so that all galleys, with the exception of the main steam galley, will be all electrically operated. All sinks and work tables, thaw tanks and cutting tables will be completely fitted with stainless steel tops, tubs and drain boards, assuring the most modern sanitary operation possible. As a holdover from troopship days, a garbage disposal unit will be maintained which features a number of covered garbage containers and a garbage grinder. These units, which were a wartime addition used to pulverize refuse prior to being discharged overboard and so decrease the hazard of being followed by the enemy because of the floating debris left behind, can now be utilized in peacetime because of their sanitary advantages and the rendering of the garbage much less objectionable from the passenger viewpoint. The vessels will continue to maintain one of their most practical features in the compartmentation of the galley so that the pantries, bake shop and butcher shop are all separate units with wide passageways serving each, rendering excellent access for waiters.

The largest electrical job on the ships, outside of the overhaul of the auxiliary generator sets, of which there



Outboard profile of Uruguay. For inboard profile, see folded insert.

are four, turbine driven, rated at 500 kw apiece, will be the installation of a new emergency generator and switchboard. At present the vessels are outfitted with only two small 15 kw gasoline driven emergency generators, and these will be replaced by a 75 kw diesel-driven unit. The new generator will be able to carry the load of the machinery spaces, the radio room, the passenger and crew exits, boat deck lighting, lifeboat flood-lights, and hospital and operating room lighting. In addition, one main light will be supplied in all spaces essential to the operation of the vessel.

All the CO_2 refrigeration machinery is to be completely overhauled and placed in first class condition. Both the ship's stores and cargo refrigeration boxes are being completely rebuilt, using wood furring, insulation and lining for bulkheads and deckheads, and wood floor covered with concrete and mastic. 2"x2" cargo battens will be used to protect the coils, and wood grating will cover the floors. This work, one of the major jobs of the conversion, entails the complete relining and insulating of 95,000 cu. ft. of refrigerated space on the Uruguay alone.

Deck fittings and machinery are to receive a complete overhaul. All hatches, cargo ports and doors are to be completely reconditioned and put in perfect working

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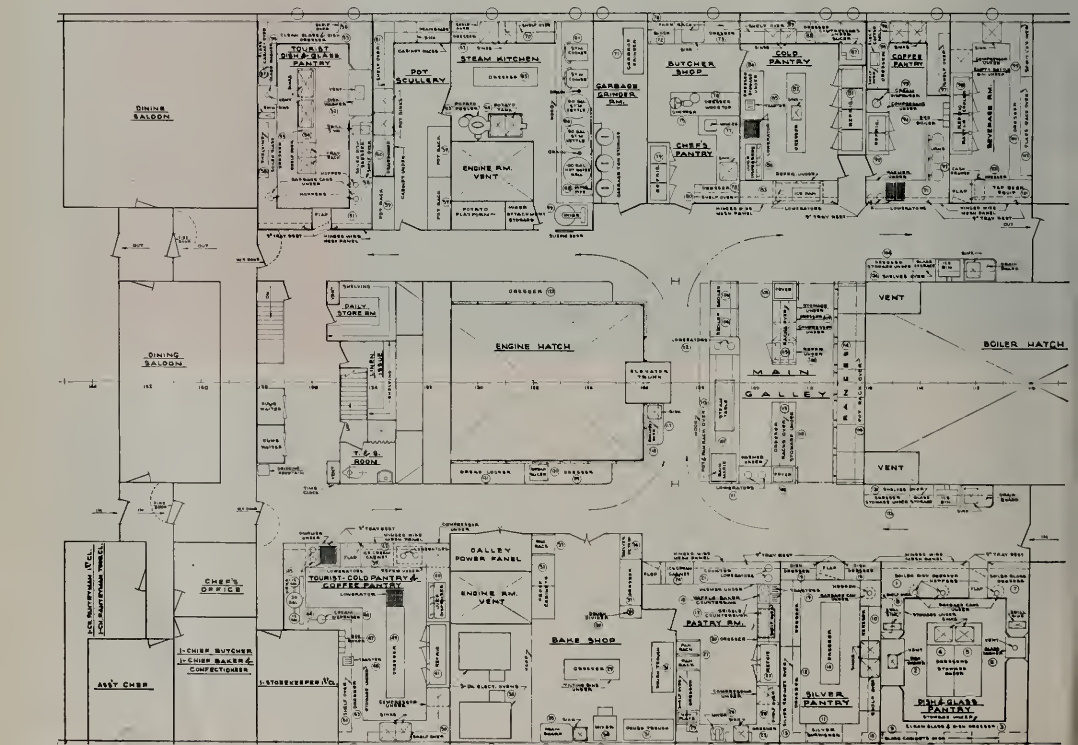
Diagram showing arrangement of main Galley, as well as various bakeshops and pantries.



ADMIRAL SMITH'S ANALYSIS OF MARITIME PLANS AND PROBLEMS

Address by Vice Admiral William W. Smith, USN (Ret.), Chairman, United States Maritime Commission, before the Propeller Club, Mariners Club, Foreign Trade Assn., S. F. Chamber of Commerce, S. F. Junior Chamber of Commerce, Commercial Club, and Women's Organization of the American Merchant Marine. National Maritime Day, in San Francisco. Because Admiral Smith gives the answers to many questions the industry has been asking, his address is here given in full.

Admiral Smith

THE SHIPPING INDUSTRY is now facing a new venture—one that should be just as appealing and as challenging as that of the SS Savannah more than a century and a quarter ago. It is the prospect of fully recapturing for the American flag the distinction, the preeminence, the world renown which were the stamp and mark of our Merchant Marine in the days of its greatest glory. I describe it as a venture because American shipping now has the opportunity of re-establishing itself in the field of world trade with a revitalized Merchant Marine and without the prewar German and Japanese competition to contend with, but, on the other hand, with the highest operating costs ever known—operating costs much higher than those of its competitors. The question is, can the industry meet that challenge?

If there is one over-all policy that I can state to you for the Maritime Commission, it is that the Commission desires that shipping be fully and completely returned to private ownership and operation as soon as possible, in accordance with the spirit and intent of the Merchant Marine Act of 1936. Whether we will ever have an American Merchant Marine one hundred per cent privately owned is, of course, problematical. It may be necessary for a long time for the Government to build and charter vessels if conditions in the industry are such that certain operators do not feel justified in making capital investments in ships. There is hope, however, that the Merchant Marine will before long become privately operated in its entirety, both in the foreign and domestic trades.

Despite the difficulties that have arisen, particularly in the domestic trade, we have made good progress toward realizing these objectives of private ownership and operation since the end of the war. At the present time there are only about a hundred dry cargo ships in operation under general agency agreements, and these, together with the 229 tankers which cannot be chartered under the law, constitute a mere three per cent of the fleet which was operating under Government control on V-J Day. Contrast this with the fact that it took the Government 15 years to get out of the shipping business after World War I.

The most serious difficulties in reconversion of the Merchant Marine to peacetime status have been encountered, as you know, in connection with the domestic trade. The Maritime Commission has approached this problem from two basic viewpoints: first, that the maintenance of a modern and active domestic fleet is of foremost importance from the standpoint of national defense; and second, that the Government, which disrupted this service by requisitioning its vessels for war use, is under obligation to do its best to help domestic shipping operators recapture their position in the transportation industry.

You are quite familiar, I am sure, with the circumstances that govern the domestic shipping situation at the present time. The operators made it clear to the Government, at the end of the war, that they could not resume operations while highly disadvantageous competitive rail rates were permitted to stand. The Maritime Commission concurred in that view, and initiated an action before the Interstate Commerce Commission requesting that adjustments be made in rail rates to give the water carriers at least an even chance to compete for the business.

Pending the decision of the ICC on the Commission's petition, we have undertaken to continue government operation of certain domestic shipping services until June 30. It is still our hope that virtually all domestic services may be returned to private operation by that date. The Commission has already withdrawn from operation in the Atlantic-Gulf and Hawaiian inter-island trades, and has approved an agreement with certain private operators in the Alaskan trade which is designed to insure continuation of adequate service to that Territory for one year after the termination of government operation on June 30. This is an interim arrangement offered to the Alaska Steamship Company, the Northland Transportation Company, the Alaska Transportation Company and the Santa Ana Steamship Company, pending further study to determine the needs of the Alaska trade and the cost of providing ship service on a permanent basis. Under this agreement the Maritime Commission proposes to return to the operators all vessels that were requisitioned for war service, and to charter to them government-owned ships as needed for the trade, including military requirements. This arrangement will insure the maintenance of approximately 30 vessels in cargo and passenger operation. We believe this to be a sound plan, and we hope, in the interests of the people of Alaska and the industry itself, that it can be successfully carried out.

As to the general coastwise and intercoastal situation, the Commission has felt it necessary to recommend to Congress that authority be given for government operation beyond June 30 should private operators still feel that they could not re-establish themselves in the business by that time. We believe that continued interim government operation is essential in order to hold this important segment of the industry intact until the difficulties which stand in the way of its full return to private operation can be ironed out. This recommendation is part of a general proposal to Congress to extend the operating authority of the Maritime Commission for all shipping until July 1, 1948, which includes also a recommendation that the Commission be permitted to charter tankers, a procedure now prohibited by the Ship Sales Act of 1946.

As a step in its plans for transition of the shipping industry from wartime to peacetime status, the Maritime Commission announced to the industry, on April 2, the approval of new terms for bareboat chartering of war-built vessels. This proposal, on which further action has been postponed until the middle of July to permit detailed study of the industry's reaction, would provide for new charters covering a period of one to three years, with the right of termination after one year on 30 days' notice by either party, instead of the present six months period with the right of termination on 15 days' notice. Until a new plan is finally put into effect, and while the Commission has its proposal under discussion with the industry, the present arrangements and rates will continue to remain in force.

Although the many and difficult problems involved in reconversion of American shipping from war to peace have commanded a large share of attention in the last year and a half, the Maritime Commission has nevertheless devoted itself to extensive study of the future requirements of the maritime industry. The latest conclusions and recommendations resulting from these studies were recently reported to the President's Advisory Committee on the Merchant Marine, and will be taken into consideration by that body in arriving at its recommendations to the White House as to the future requirements of the industry.

These recommendations by the Commission, covering both immediate and long range programs for new ship construction and betterments, have been submitted to the President's Committee, and since they are so new I think you might be interested in hearing some of the highlights at this time, particularly as they refer to the shipping industry on the Pacific Coast.

In this report, written from the standpoint of vessel requirements for adequate American flag service on the principal trade routes of the world, the Maritime Commission takes the position that the principal need of the American Merchant Marine is for passenger ships. While the status of the Merchant Marine in the matter of cargo vessels may not be thoroughly balanced as to all services, we are now in a much stronger position from both the commercial and national defense points of view than before the war. Such, however, is definitely not the case with respect to passenger and combination passenger and cargo vessels. As of September 30, 1939, there were 127 vessels, with total passenger capacity of 38,357, in active operation under the American flag in foreign, non-contiguous, coastwise and intercoastal trades. These vessels, many of them old and slow, were carrying about 43 per cent of the 1,196,000 passengers moving in various United States trades at that time.

When the war came in 1941 the entire passenger fleet passed into Army and Navy hands. By the end of 1946, 52 of these ships had been sunk or destroyed, and only 16 were suitable for reconversion for permanent, long range passenger use. These, together with 20 war-built vessels suitable for utilization as passenger carriers, gave us a total of 36 ships, with passenger capacity of 8,333, in service or under construction as of the end of 1946. Thus we stood at that time 91 vessels short of our prewar passenger fleet, with a decline in carrying capacity of 30,024 passengers.

To remedy this situation in the immediate future, and to provide for the requirements of the Merchant Marine for the next ten years or more, we have evolved what we call an immediate long range program calling for the provision of 101 ships with passenger capacity of 33,132, or 103 ships with passenger capacity of 34,232, depending on a choice between two proposed plans for new construction. The Commission itself has not as yet been able to decide between these two new construction plans, and perhaps the industry will let us know how it feels about them.

Plan Number One proposes the building of 65 vessels, including four express passenger liners, or super-liners, two of them to be placed in service in the transatlantic and two in the transpacific service. Plan Number Two proposes the construction of 67 ships, including six

(Please turn to page 76)

LEWIS A. LAPHAM HEADS AMERICAN HAWAIIAN

With even more problems to solve than most steamship company heads, but with the goodwill of the entire industry and with a world of ability and energy, Lewis A. Lapham takes the helm of American-Hawaiian Steamship Company.

MONEL SHAFT SLEEVES ON ARMY DREDGES

IN THE APRIL 1946 Pacific Marine Review the Army Engineers' seagoing hopper dredges under construction at the Ingalls shipyard were described in some detail. An insert showed inboard and outboard profiles, deck plans, and machinery and dredging equipment layouts. The first of these, the Comber, went to sea for trials during May. These dredges have a feature in their Monel shaft sleeves which is so important to the art of shipbuilding that it is worthy of further attention.

The Comber, one of a fleet of four 352-foot ocean-going, hopper type dredges being built by Ingalls for the Corps of Engineers, U. S. Army, recently was photographed in the wet docks of The Ingalls Shipbuilding Corporation's Pascagoula, Miss., yard, where she is outfitting.

The Comber and her sister ships, the Gerig, Langfitt and Biddle, are all equipped with 3,000 cubic yard capacity suction dredges as well as the latest navigational aids enabling them to go anywhere in the world.

Propeller shafts on dredges operating on the lower Mississippi and its tributaries, as well as in the coastal water at its mouth, must fight both the corrosion of salt and brackish water and abrasion. Both are severe.

Generally, the dredges are anchored head-in to the current or the tide. To prevent strain on the anchor chain, and possible dragging of the anchor and consequent slipping away from the point where dredging operations are being carried on, the shafts are kept turning slowly. This, together with the action of the dredging buckets, stirs up the sand, mud, and other deposits from the bottom and spins hard particles of these solids against shaft and sleeves.

In the past, life of the sleeves under these conditions often was short. It frequently was shortened further by corrosion. Architects and engineers in their efforts to prolong the intervals between the removal of the shaft for re-sleeving finally turned to centrifugally cast sleeves of Monel with cutless rubber bearings. It was found that these sleeves gave an average life three times longer than that of the sleeves previously used.

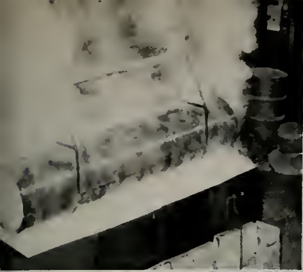
Recently, four new dredges were built by Ingalls Shipbuilding Company at Pascagoula, Miss., and placed in operation by the U. S. Army engineers. They were equipped with steel shafts. Monel sleeves were centrifugally cast by Shenango-Penn Mold Co. to finish 17⅛ inches in outside diameter and 6 feet 3¾ inches in length with a wall thickness of 1⅛ inches. Already these sleeves have confirmed the lessons of previous experience with the wear and corrosion resistance of Monel.

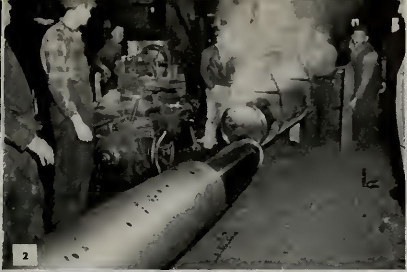
The sleeves were shunk-fit onto the shafts by Dibert, Bancroft, and Ross, Ltd., New Orleans. They were first expanded by heating in an oil bath for 1½ hours to raise them to a uniform temperature of 675° F. throughout their structure and then placed on the shafts.

Each of the four dredges, which has a capacity of 3,000 cubic yards each of dredged material, is equipped with two shafts. Each shaft has a stern and forward sleeve, both water lubricated.

In order to minimize sand in the lubricating water, its suction is taken from a point far forward of the dredging scoop. The combination of the Monel sleeves in rubber bearings is the most efficient guard against the considerable amount of sand that cannot be avoided by this precaution.

Naval architects Joslyn & Ryan of San Francisco, prepared the specifications for the Army jobs, and called for shaft liners to be made of "nickel-copper alloy conforming to Federal specifications — QQ-C-551 Monel Metal or equal, and centrifugally spun". These liners were subjected to a hydrostatic test of 20 lbs. per square





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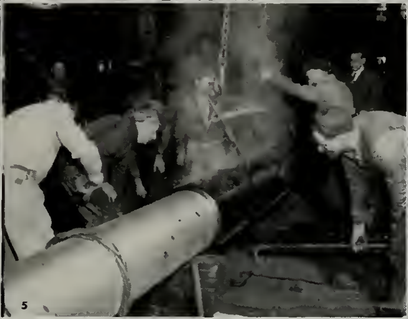

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9

inch pressure as a test of porosity before being shrunk on the shafts.

The liners were fine machined on the inside with allowance of tolerances for shrinkage on the shafts. Outside diameter was rough turned with allowance of ⅛ inch for final finish. The series of nine pictures on this page shows the entire process from preparing the sleeves to the completion of the assembly. In picture number 1, after precision machining the inside diameter for shrinkage allowance of .005″ per inch of diameter, the sleeve is uniformly heated to approximately 600° F. in a bath of high-flash oil. These 15″ ID sleeves are thus expanded to about 1/10″ over-size, for slipping easily over the precisely machined shaft.

In number 2, with the aid of a delicately controlled overhead crane the sleeve is brought into axial alignment with the overhung end of the shaft.

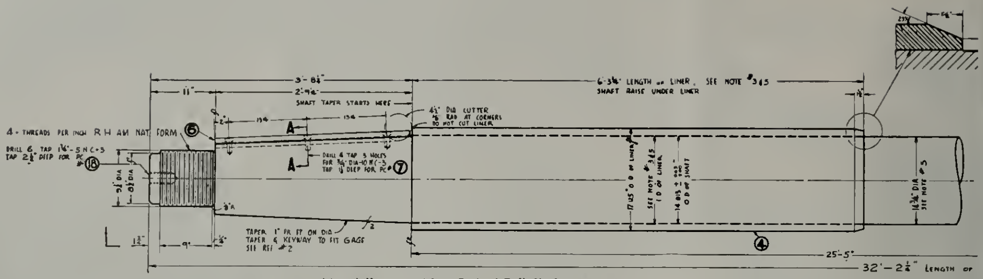
Number 3 shows the cradled sleeve now being entered carefully over the threaded end of the shaft and up toward the head of the taper on which the propeller will eventually be seated.

In number 4, with the weight of the sleeve still carried by the cradle, it is carefully but quickly moved along toward its final destination on the shaft by means of special guide tongs in the hands of expert workmen. Owing to the small amount of clearance and the rapid rate of cooling, it is essential that this phase of the work proceed without hitch. Note the chalk mark on the shaft in the lower left-hand corner indicating final position of the inboard end of the sleeve.

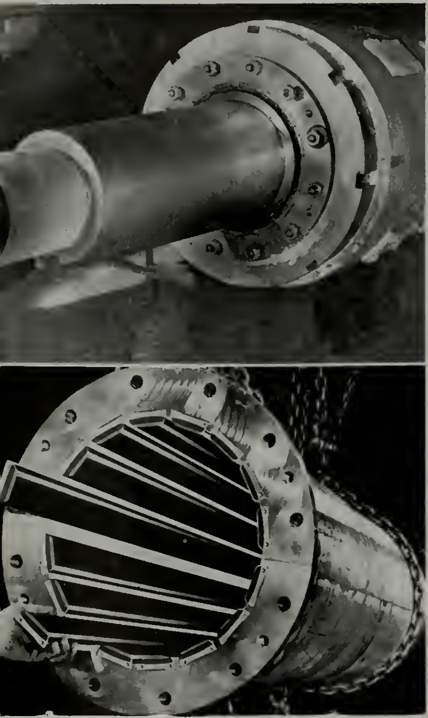
5. Final position of the sleeve has been reached and the cradle is lowered for removal. Even though this is a frequently executed item of shop work, it never fails to draw an interested audience from other departments.

6. After sleeves have been shrunk in place at both ends of the shaft, the previously rough turned outside surfaces are machine finished to final diameter and perfection of surface suitable for maximum service life in the water lubricated rubber bearings at both ends and in the packing at the forward stuffing box.

7. In this picture taken at the shipyard, the upper half section of bronze shell of the Goodrich cutless rubber



Monel liner on After End of Tail Shaft—see below.



GOODRICH CUTLESS BEARINGS—the segmental type.

Above: The bearing (17⅛" I.D. over 6½" long), is one of 16 furnished by Lucian Q. Moffitt Inc., Akron, Ohio, for the propeller shafts of the four 352′ (3000 cu. yd. — 6000 shp), twin screw seagoing hopper dredges built by Ingalls Shipbuilding Corp., Pascagoula, Miss., for the Corps of Engineers, U. S. Army. Joslyn and Ryan of San Francisco were the naval architects.

Below: The photo shows some of the individually removable bearing strips partly withdrawn.

bearing is being slid into place. Note: Rubber faced dovetail strips are separately removable for convenient replacement in case of unexpected damage.

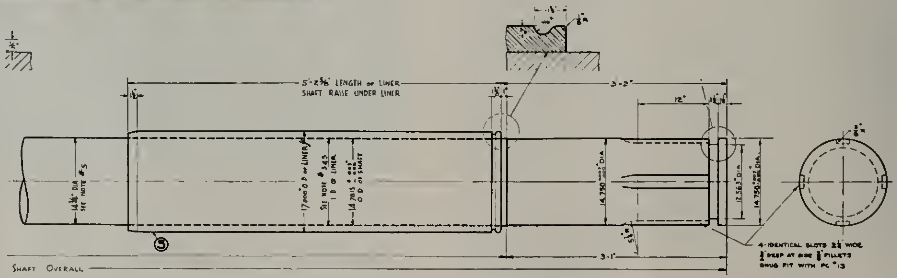
8. After both sections of the bearing shells have been bolted home, about 2″ of the Monel sleeve is left projecting for contact with rubber gasket arranged in counterbore of the propeller hub face. This is for watertight protection of the tapered end of the steel shaft to prevent possibility of galvanic influence from the large mass of bronze in the propeller hub.

9. Completed assembly of propellers on shafts in rubber bearings. Contrary to usual arrangement for scooping lubricating water into forward end of the rubber bearing, in these dredges the lubrication water is taken in at a point of the hull far forward of the sand scoops working amidships, to minimize the sandy content of the lubricating water.

These dredges are said to be the most completely self-containing ever built and will permit long-time and far-distant operations.

Monel Shafting

That Monel shafting is proving a worthwhile investment is indicated by its increasing use in such vessels as fishing boats and yachts. The International Nickel Co. reports that stocks of standard size shafting are now being planned in convenient centers around the country. On the Pacific Coast the Pacific Metals Co. Ltd., 1400 South Alameda St., Los Angeles, already has a good assortment, while Pacific Metals in San Francisco and Eagle Metals in Seattle are prepared to render service.



Monel liner on Forward End of Tail Shaft—see above.

STEAMSHIP ACCOUNTING

By ARTHUR B. POOLE

PART II

Accounts Related to Balance Sheet

Asset Accounts

Accounts receivable from interline carriers may be of moderate size, but in general transportation is not provided on credit terms and the accounts receivable of a steamship company are likely to consist of interline accounts, subsidy earned, government bills of lading unaccomplished, and items other than amounts due from commercial customers, the total being substantially less than that of a typical manufacturing or distributing corporation.

A subsidized operator will have a Capital Reserve Fund on his balance sheet. Into that fund go all earned depreciation on the subsidized vessels and the proceeds of all subsidized vessels either sold or lost. From it replacement vessels are purchased or reconstruction of existing vessels is paid. Such payments include the meeting of mortgage maturities on vessels. Subsidized operators understand that any gain upon disposition of vessels is exempt from tax under Section 607(h) of the Merchant Marine Act, 1936, quoted above, but the Treasury Department has not yet conceded this point. For vessels involuntary sold or lost, a capital reserve fund takes the place of a replacement fund under Section 112(f) of the current Internal Revenue Code, except that a replacement fund offers, in effect, tax deferment, while a capital reserve fund is believed to offer tax exemption.

Another item peculiar to the balance sheet of a subsidized operator is the Special Reserve Fund. Into this fund go all earnings in excess of 10 per cent on "capital necessarily employed" in the subsidized operations, as defined and determined by the Maritime Commission. Half of such earnings, calculated cumulatively and not in excess of the entire operating-differential subsidy received during the period, is considered held for settlement with the Maritime Commission, but all of such earnings are available, if required, to replenish operating funds exhausted by current voyage losses. Upon recapture settlement any remainder in the special reserve fund, except 5 per cent of "capital necessarily employed" withheld as a nest egg for the next subsidy period, may be withdrawn subject to the federal income tax rates in effect at that time.

Either a nonsubsidized or a subsidized operator may have a Construction Reserve Fund under Section 511 of the Merchant Marine Act, 1936, into which may be paid the proceeds of non subsidized vessels. Such a fund resembles more closely the replacement fund of the current Internal Revenue Code, in that it offers only tax deferment and not tax exemption. The deferred tax is ultimately paid as the result of depreciation deductions limited to those calculated on the tax base of the vessel sold or lost (exclusive of any capital gain deposited in the fund). The advantages which a construction reserve fund offers over a replacement fund are (a) the fact that it is open to the proceeds of vessels lost or sold voluntarily as well as involuntarily, and (b) the advantages, if any, of administration jointly by the Maritime Commission and the Treasury Department instead of by the Treasury Department alone.

The capital asset accounts of a steamship company usually reflect chiefly owned vessels. As mentioned earlier, subsidized operators now use a very conservative useful life (20 years) in calculating depreciation. Thus, barring unexpectedly large obsolescence, the fleet is likely to have an unamortized value on the balance sheet somewhat less than might otherwise remain to be spread over its remaining life.

Another asset account which differs no whit from the related account in other balance sheets, but is likely to be disproportionately large in comparison, is unearned insurance premiums. The values of individual steamships are large, the risks of loss and of general liability are substantial, and the premiums consequently are a major element both in the balance sheet and in the calculation of voyage profit. Steamship companies usually find it wise to cover the vessel risks with policies extensive both in their breadth of coverage and in the amounts of protection.

Liabilities

On the liability side of a steamship company balance sheet it is normal to have large balances for tickets sold for voyages both not yet commenced and commenced but not terminated. Also, it it normal on many ocean-trade routes for most freight to be prepaid. Accordingly, there may be large amounts of freight moneys received on voyages commenced but not terminated. Since the wage and repair obligations are not determined until the end of the voyage, and the stevedoring and certain other costs accrue only as the voyage proceeds, there is to be expected at any one time a substantial balance of deferred revenue over the amount of vessel and voyage expenses incurred on unterminated voyages. In fact, one could go so far as to say that in the steamship business, instead of financing your customers, your customers may easily supply all your net working capital.

A steamship company customarily stores its vessels directly from wholesale dealers, and maintains only small inventories of stores and spare parts. Hence usual credit terms are short, payments are prompt, and accounts payable are comparatively small in total.

No other balance sheet account seems to require comment except that a subsidized operator will likely have a liability to the Maritime Commission for operating-differential subsidy recapture, as previously described herein. He may also have a small amount due the Maritime Commission as refund of construction-differential subsidy, measured by incidental revenue which he may have earned between domestic ports located on his trade route to a foreign country or countries. Since domestic carrying are protected by cabotage from foreign-flag competition, any construction-differential subsidy received to equalize construction costs with those of foreign shipyards must be refunded to the Maritime Commission to the extent that such subsidized vessels may in fact carry domestic freight or passengers.

Steamship Accounting Methods and Procedures

Accounts Receivable and Revenue Collections

From the preceding description of accounts certain procedures typical of steamship accounting may readily be inferred. Thus, no customers' accounts receivable ledgers are kept. Instead, bills of lading and ticket stock form the basis of collection of revenue, and the freight cashier and passenger ticket issuers, respectively, are held primarily responsible for revenue collections.

Freight revenues arise from revenue tons determined by the weighers and measurers of cargo at the dock and from rates specified by special rate clerks who know the large and complicated tariffs. The tonnage and rates are entered on the bills of lading and the vessel's manifest summarizes all the bills of lading issued for the given voyage. The freight cashier is required within a short period to account for all moneys indicated on the manifest as collectible from shippers or consignees at his port on the voyage in question.

Passenger revenue arises almost wholly from space assigned in the shoreside passenger office to a person who has purchased a ticket before he embarks. Collection of passenger revenue is assured by holding the passenger office responsible for ticket stock delivered to it. The passenger manifest, prepared by the vessel's purser and showing space occupied and ticket numbers, serves as a check on the monthly reports of tickets issued by the several passenger offices.

Accounts Payable

Another inference from what has been said earlier in this paper is that frequently steamship companies maintain no ledgers for trade accounts payable, but rather make charges to the respective accounts direct from a copy of the voucher check used in paying invoices. A vendor's index, containing notation of invoice amounts, is useful for record purposes, including that of "reciprocity" when that is a factor in securing tariff.

Traffic Analysis

A successful steamship company must watch with care its average freight rates, and have a keen eye to notice dwindling commodity movements and to build up movements of new commodities and movements of old commodities to new ports. Thus it is important that the bills of lading be analyzed in a number of ways. The commodity itself, the shipper, the consignee, the port of loading, the port of discharge, the freight rate, the total freight, the soliciting freight office, and the weight and measurement tonnage are all factors of interest. Fortunately the average bill of lading covers enough freight fully to justify the use of a punched card, and punched cards are extensively used for freight traffic analysis.

Some use in the industry is also made of punched cards for similar analysis of passenger tickets sold, but this use of punched cards is less extensive than for bills of lading.

Controlling Accounts in Voyage Accounting

The most elaborate system of controlling accounts found in steamship companies is that having to do with voyage profit. The sequence of controlling accounts is typically as follows: Vessel and voyage expense in total; then by trade routes; then by individual voyage on a trade route; then by individual expense on the voyage.

Passenger revenue and freight revenue are controlled by similar controlling accounts.

Accounts in Foreign Currencies

Naturally, steamship companies have to deal very largely in foreign exchange. Steamship companies have been able so far, however, to require payment of freight and passenger revenue in U. S. dollars or other stable currency, or their equivalent. The "other stable currency" or the "equivalent" is, in the case of experienced American steamship companies, almost instantly converted into U.S. dollars, thus removing both the risk of foreign exchange fluctuations and the chore of maintaining and converting accounts kept in foreign currencies.

Home Office Concentration of Accounting Work

Steamship companies get financial data from a very large number of domestic and foreign branches, agents, vessel pursers, and connecting lines. It is uniformly the practice to require straight factual reports from all these sources, and to perform nearly all bookkeeping and auditing duties at the home office. Needless to say, it is quite a task to fit all of these reports together to provide the complete and accurate story of the voyages terminated during the month, each voyage account being composed of transactions in perhaps 15 to 30 calls at 6 to 25 different ports, in nearly as many different countries.

Crew Payrolls

Because of the elaborate nature of crew payrolls steamship companies must maintain capable and alert crew payroll audit sections. Added to the accural of basic wages for the odd periods of voyage duration there are the complications of overtime, area bonuses, "penalty" wage additions, allotments, money advances, "slop chest" charges, fines by the master, and earned vacation credits, not to mention the usual tax deductions and withholdings. Allowance for the value of meals and lodging furnished must be made for certain deductions but not for others. Added to all this is the necessity of almost immediate payoff upon arrival at the last port of the voyage, although the purser may have been unable to complete his payroll ready for submission to the auditor, and quick shoreside assistance to him is required.

Invoices

Frequently the operating manager of a steamship company will want, when he gets his voyage report from the accounting office, personally to review all the costs of the voyage. For that reason it is necessary to maintain invoice files, so that all invoices pertaining to a given voyage may readily be available in a single place. Subsequently the audit of the voyage by the Maritime Commission will require the submission of the invoices in the same way.

Special Operations Schedules

The previously mentioned obligation to relate a great mass of surplus adjustments back to the years and voyages to which they technically belong requires the maintenance of special schedules, which in effect hold operating accounts open for several years.

Steamship Cost Accounting

Three items on this subject appear to merit attention in this paper: Unit revenues and costs as calculated from voyage statements, allocation of costs as between freight and passenger traffic, and allocation of overhead to voyages.

Voyage Costs and Statistics

The second sheet of the voyage statement tells exactly what unit costs one large steamship company finds it worth while uniformly to compute: cost of a meal of each class, average cost of fuel per barrel, fuel consumption per day in port and while steaming, fuel consumption per steaming mile and per engine mile, average revenue per freight ton, cargo expense (chiefly stevedoring) per ton, and voyage cost per dollar of revenue.

All of these unit costs need to be mentally or actually adjusted to meet the applicable conditions. For example, if fuel cost was high, was the higher cost occasioned by purchasing fuel oil in out-of-the-way ports in order meanwhile to gain more deadweight capacity for high-rate cargo? If the fuel consumption was light, is that fact traceable to the low deadweight on that voyage? If the revenue per freight ton was low, was a considerable portion of the cargo of a liquid nature, requiring almost no loading or discharge expense? Conversely, if the cargo costs were high, was the average freight rate sufficiently high to more than cover them?

These examples suffice to illustrate my point, which is that nearly all unit costs are good or bad only in relation to the other factors with which they are interrelated. A cost accountant can have a field day working with the unit costs of almost any steamship voyage.

It might be helpful at this point to insert a definition of revenue tonnage. Revenue tonnage is the tonnage on which freight is computed. A weight ton is usually 2,240 pounds in foreign trade, frequently 2,000 pounds in the domestic trade. A metric ton is almost the same as a long ton of 2,240 pounds. A cubic ton is usually 40 cubic feet, although there are exceptions, rubber from Singapore, for example, being measured at 50 cubic feet to the ton. It is usual for the freight to be computed, at the carrier's option, on weight or measurement, whichever will give the larger revenue. Thus, it is possible for the revenue tonnage on a given voyage, ignoring even an allowance for broken stowage, to exceed both the cubic tonnage and the cargo deadweight tonnage. The cargo bookers naturally try to secure balanced cargoes, so that the ship will be "full and down," that is, with both her cubic and deadweight capacity fully used.

Joint Passenger and Freight Costs

One of the most interesting things to me in my steamship accounting experience is that I have never yet run across a serious, fully developed set of cost accounts setting forth the relative net profit of the passenger and freight traffic carried on a given vessel or group of vessels. Obviously such cost accounts, if available, would be useful in developing the rate structure, and in the design of new vessels, and might lead on occasion to major alterations in vessels in service.

Of course the revenue from the sale of passenger tickets and transport of excess baggage is accurately known; and so is the revenue from carrying of cargo and mail. It is on the cost side that analysis bogs down. In the first place, the entire design of the vessel is affected by passenger facilities. The cubic space occupied by passengers and the extra crew members who care for them is taken partly from what would otherwise be cargo space and partly by enlarging the superstructure. The cargo deadweight capacity is affected by a change in the safe load line, by the weight of the superstructure, by the change of the center of gravity, and by the weight of additional compartmentation bulkheads. The higher speed required for passenger service involves heavier and larger propulsion equipment, heavier loads of fuel oil, and finer hull lines affecting the cubic cargo capacity of

(Please turn to page 120)

THE PORT OF LONG BEACH CONTINUES AS AMERICA'S MOST MODERN PORT

$87,000 PER DAY INCOME

MANY EXCEPTIONAL CONDITIONS contribute toward developing the Port of Long Beach, California, which makes it a Port unique in its field. Of major importance is its extreme good fortune in the discovery of oil and the immense revenue being derived from the land actually owned by the City of Long Beach, California and administered by the Board of Harbor Commissioners.

To date, there are 275 wholly owned wells and 58 in which it has a major interest, thus totalling 323 wells with a daily production averaging 50,000 barrels. The average value of this oil is $1.74 per barrel, or approximately $87,000 per day income. The Port of Long Beach, California is the seventh largest independent producer of oil in the State of California, famed as one of the largest oil producing states in our nation.

As a consequence, the Board of Harbor Commissioners of the City of Long Beach, have completed long-range plans for the expenditure of over 69 million dollars toward the building of America's Most Modern Port.

A. K. Maddy, executive secretary and E. J. Amar, port manager of the Port of Long Beach.

Currently active wharf and pier developments include the following:

(1) The one-story steel frame transit shed at Berth 5, Pier A—Peter Kiewit Sons' Company, Contractors—will be completed in July of this year. The structure is 120 feet by 608 feet, of rigid frame clear span construction, free of interior columns. Cost—$550,000.00.

(2) The one-story steel rigid frame transit shed at Berths 3 and 4, Pier A, of similar construction, is due to be completed about September, 1947, at a cost of $700,000.00. This building is 120 feet by 832 feet and is divided at the midpoint by a fire wall.

(3) Bids are to be called for immediately on a new one-story steel and reinforced concrete transit shed 200 feet by 1152 feet to be located at Berths 6 and 7, Pier A. Construction work on the site will probably not be commenced before early autumn. This building also will be free of interior columns.

(4) Construction work has commenced, with Pugh Construction Corporation as general contractor, on the replacement of wharves at Berths 52, 53, and 54, Inner Harbor—generally known as Pier 2. This structure replaces with what will in effect be fireproof quay wall construction, the lumber pier which was completely destroyed by fire in 1945.

Shortly before completion of the quay walls, a transit shed of steel frame construction with area of 140,000 square feet will be advertised for bids. This will probably be about November, 1947.

(5) The Port has under contract 1500 tons of new steel girder rails with Bethlehem Steel Company; frogs and switches with Racor-Pacific Company; and 35,000 tons of steel sheet piling with Bethlehem Steel Com-

Aerial photograph of the expansive Long Beach Harbor, better known as the Port of Long Beach, California.

pany and Columbia Steel Company (50% to each) for use on the following projects, for which construction bids will be advertised during summer and early fall of 1947.

(a) *Pier B. Extension*

Initial work on this project will include the bulkheading and hydraulic filling of a 1200-foot by 500-foot extension to existing Pier B.

(b) *Pier C*

Initial work on this project will include the bulkheading and hydraulic filling of the entire pier, 600 feet by 2360 feet in dimensions. Wharf work, utilities, transit sheds, etc., will be separate future work.

(c) *Southeast Basin Project*

Initial work on this project will be the bulkheading and filling by hydraulic dredging of approximately 400 acres which will form the northerly and easterly sides of the Southeast Basin. In approximate quantities the work will involve 35,000,000 cubic yards of dredging, some 2,000,000 tons of rock work and 6500 linear feet of cellular steel sheet pile bulkhead.

Utilities, streets and other improvements will follow as separate projects.

Traffic Relief

The Terminal Island Freeway into Long Beach Harbor—approximate cost $14,000,000—is being rapidly advanced with completion due within about one year. This freeway includes complete grade separations of highways and railroads for a distance of 3.2 miles from Willow Street, Long Beach, to Seaside Boulevard, Long Beach, at the center of the United States Naval Shipyards and Operating Base, Terminal Island, Long Beach.

Initial work on the Pico Avenue Freeway which follows the Los Angeles River directly into the Outer Harbor, Long Beach, is progressing. Right-of-way has been obtained for some four miles of freeway and the underpass at Willow Street has been contracted to Guy F. Atkinson Company.

Special Facilities

(1) Preliminary drawings are being prepared for a new terminal to accommodate the Alexander Line passenger ships which will operate between the Ports of Long Beach and San Francisco.

(2) A program of utility extensions, fire protection work, local street improvement and street lighting will be undertaken during the year 1947-48.

Federal Off-Shore Breakwater

Case-Connolly-Kiewit, in a joint venture, are constructing the second island unit of the outer breakwater under contract with the United States Army Engineers. When completed, this unit will be 13,850 feet long.

Engineering and model studies have been completed for the further extension of the breakwater to provide protected anchorage opposite the United States Navy Ammunition and Net Depot at Seal Beach, which will in effect be a further extension to the east of the Port of Long Beach .

It cannot be denied that the Board of Harbor Commissioners of the City of Long Beach, California are alert to the unusual opportunities available to them, for they are losing no time in the effort to make the Port of Long Beach, California, America's Most Modern Port.

JAPANESE MERCHANT FLEET WARTIME AND POSTWAR CONTROL

By H. L. HAEHL, JR.

Part II

The first installment of Mr. Haehl's article ran in the May issue of Pacific Marine Review.

Commander Haehl, Jr. (third from left) with group of fellow officers aboard a returning troop transport, after his war assignment in Japan.

WHEN THE AMERICAN SHIPPING CONTROL UNIT, SCAJAP, was organized the Japanese liaison representatives for merchant vessels were from SCA, the Shipping Control Association, a branch of the Ministry of Transportation. All Japanese military vessels were represented by officers from the Navy Ministry, later changed to the Second Demobilization Ministry. General policies as to the employment of Japanese shipping, the trading areas and the relative priorities of the various areas from which Japanese were to be repatriated, were decided by SCAP—the abbreviation for Supreme Commander for Allied Powers—General MacArthur. These policies were translated into specific voyage authorizations, issued by SCAJAP to the Japanese Minister of Transportation.

One military command had been replaced by another, but the Japanese private operators, although scattered, dominated and defeated in their battle with their own government, soon rallied and prepared for a comeback. Many factors favored them. One was the announced long-term policy to do away with the many totalitarian state corporations, the "Control Associations", which governed all major industries in the approved Fascist fashion. SCA was one of these. Another factor was the deplorable condition of affairs under SCA, only a part of which could be blamed on the war. For instance, SCA's payroll was fantastically overstuffed. In many offices, less than 20 per cent of those drawing pay ever did any work or even appeared at the office except on payday. Seamen's affairs were in a mess. Those who were not working drew as much pay as those who did, and those who did work were not paid enough. For some unexplained reason, charter hire was still being paid on vessels which had long been sunk, some of them several years before. Long after fighting ceased, SCA was still paying war risk insurance at an undiminished rate. In short, what we found to be SCA's operating method was a strong argument for return to private operation.

But there were other even more pressing factors requiring the continuance of centralized government control for some time at least. To appreciate this, one must recall the situation existing at the surrender. Japan had entered the war with roughly 6,300,000* tons of merchant shipping. During the war, she had built about 4,000,000 tons for a total of 10,300,000. Of this great fleet, only 1,500,000 tons remained, of which only about 1,000,000 tons were operable. Many of the remaining vessels were war-built and of exceedingly poor quality. This was only about 16 per cent of the prewar fleet and less than 10 per cent of the wartime total. In the later stages of war, ships had been used exclusively for military needs, and cargoes essential for civilian economy had been neglected. The ships had been run to death without proper maintenance or repair and were almost all in need of major repairs. High explosive and fire-bomb damage, so much greater than we had believed it to be, made the need for housing materials and fuel particularly urgent with winter coming on. Stock piles of food were depleted and had been largely destroyed in the big cities. In short, the need for cargoes essential merely to sustain life was so great that not a single ton of shipping could be spared for anything other than high-priority cargo if the inevitable famine and starvation were to be kept from assuming even greater and more catastrophic proportions. In these circumstances, and because of our commitment in the Potsdam Declaration, the Supreme Commander's policy was to employ all available tonnage in carrying food, coal, and lumber in order to reduce the terrible death toll expected during the following year.

The materials most essential in Japan's fight for life were low-freight cargoes. The emergency was too great for an immediate return to uncontrolled private shipping with the attendant risk of diverting tonnage to high-freight or luxury cargoes. The war having made everything scarce, shipowners could hardly be expected to resist the temptation to make fortunes overnight in uncontrolled trade. One possibility would have been to remove controls on freight rates for essential materials and thereby make them financially attractive cargoes, but this would have raised the price of the materials carried and would have increased the already gravely dangerous inflationary pressure.

Another factor preventing return to private operation was the fact that a relatively small number of Americans had to exercise complete control over all vessels. We had to be sure of what was being done with these ships and to direct their employment. We did not have sufficient personnel to station representatives in every port and on every ship. It was only by having the Japanese government retain control that we, by giving orders to the government, could exercise the control essential to performing our mission and seeing to it that no tricks were attempted.

Actually, the ship owners could not have resumed private operations for a long time anyway. Their personnel had been scattered, their offices closed, their records destroyed, and most of their ships sunk. Those who were part of the Zaibatsu were faced with, and later underwent, dissolution. The steamship companies were crippled by industrial anemia following long exposure to fascist control. Initiative, organization, and spirit had wasted away. So it was decided that, while return to private operation was the goal toward which future efforts would be directed, it could only be obtained gradually. Private Japanese shipping would have to learn to walk again before it could run uncontrolled.

Because of the initial possibility that some tricks would be attempted—an event which did not occur, but which was a definite possibility at the time—all phases of occupation control proceeded with great caution at first. This caused some entirely undeserved criticism of General MacArthur as being too "soft". But when you have several million Jap soldiers still armed—as was true for several months—anything short of caution would have been foolhardy. Shipping control was no exception. In the first months of the occupation, SCAJAP had to authorize every movement of every vessel. Even a shift to a bunkering dock or repair yard within Tokyo Bay required a written authorization and dispatch advices to all military commands involved. Ships found in places which did not check with previous dispatch information were likely to be fired upon.

Soon this rigid and time-consuming control was loosened. Fishing vessels were given blanket authorization to operate in designated areas. Inter-island ferry services were given blanket approval and later such approval was

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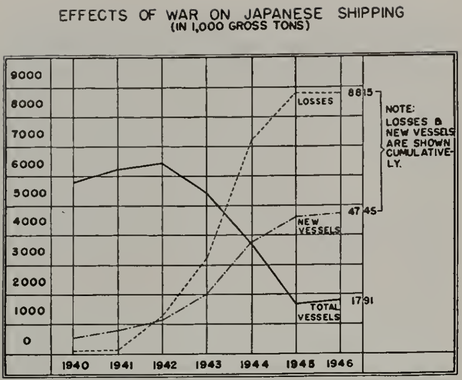
* Tonnage figures throughout are gross tons, excluding vessels under 100 tons.

Hikawa Maru, a hospital ship, is the only N Y K Transpacific passenger liner to survive the war. Tonnage is 11 621 tons and maximum number of passengers that can be carried in her evacuation work is 2[illegible]00



This chart of annual tonnages and losses was released by American authorities in Japan. The vertical lines above each listed year apparently relate to the end of that year, since substantial annual losses commenced in 1942 and continued into 1945. Note that the rate of loss exceedeed new construction throughout the war; that cumulative losses passed total new construction in late '42, resulting in an accelerating decline of total merchant tonnage for the balance of the war.

given to vessels ferrying repatriates between certain Japanese ports and designated ports in China and Korea. Still later, prior authorizations for cargo voyages within the Empire were no longer required, but daily reports had to be made to SCAJAP on the location and employment of all vessels. Ships leaving the home islands for repatriation or for long cargo hauls still required prior approval.

Meanwhile, the Japanese Navy had been demobilized and finally turned over all of its non-shooting vessels to SCA which, in turn, had also been reorganized and had become the Civilian Merchant Marine Committee, still under the Ministry of Transportation. During the first year of the occupation, a tremendous job was accomplished under SCAP and SCAJAP. Control of cargo operations was largely a matter of allowing the Japs to try to save themselves, but we had a definite interest in seeing that the Jap armies were disarmed and brought home as soon as possible. Hence, considerable importance was attached to the repatriation of Japanese nationals from all areas and the return of Chinese, Koreans, and Formosans from Japan. A large share of credit for this goes to SCAJAP, for, in addition to carrying out the policies of the Supreme Commander and exercising supervisory control, the officers of that command constantly kept pressure on the Japanese to speed up repatriation in the face of an apparent reluctance on their part in many instances. Often only a very tough attitude could prevent the Japanese from recurring delays and procrastination in bringing back soldiers, for they would just

NUMBER AND TOTAL TONNAGE OF VESSELS 1000 GROSS TONS AND UPWARDS FOR YEARS 1930 TO 1940 AND 1941

Type of Vessel	(1930)		(1931)		(1932)		(1933)		(1934)		(1935)	
G/T	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
1000 - 2000..........	251	361,195	245	349,846	232	329,745	223	316,588	219	311,476	220	313,368
2000 - 3000..........	215	523,315	208	506,406	198	482,410	181	438,373	170	409,530	169	408,630
3000 - 4000..........	157	529,116	158	531,954	157	529,499	145	486,829	142	476,392	137	460,154
4000 - 5000..........	103	459,841	103	459,869	100	447,172	92	411,277	90	401,940	96	429,930
5000 - 6000..........	154	863,445	155	870,624	152	854,256	155	869,060	144	806,802	139	778,346
6000 - 7000..........	55	357,981	56	364,949	58	376,803	59	384,434	60	392,620	64	419,835
7000 - 8000..........	41	300,695	42	308,107	42	308,107	45	330,847	49	359,398	50	364,881
8000 - 9000..........	16	135,043	16	135,050	17	143,456	18	151,857	20	168,118	20	168,123
9000 - 10,000	17	161,694	18	171,477	18	171,522	18	171,691	18	171,691	18	172,468
10,000 Upwards....	19	237,887	19	237,947	19	237,947	18	224,546	20	244,647	19	231,138
Total	1,028	3,930,212	1,020	3,936,229	993	3,880,917	954	3,785,502	932	3,742,614	932	3,746,873

Type of Vessel	(1936)		(1937)		(1938)		(1939)		(1940)		(1941)	
G/T	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons	No.	Gross Tons
1000 - 2000..........	225	321,845	238	342,033	252	367,345	272	401,467	291	433,672	310	464,676
2000 - 3000..........	173	421,164	185	454,423	201	495,087	209	516,963	222	552,755	238	596,833
3000 - 4000..........	145	488,908	152	513,166	169	571,693	173	587,184	192	653,368	199	679,858
4000 - 5000..........	101	452,683	114	511,154	136	609,248	143	640,195	143	640,693	151	678,788
5000 - 6000..........	140	782,070	149	830,348	169	936,909	173	958,697	181	1,002,062	184	1,018,967
6000 - 7000..........	68	446,652	78	514,850	97	638,089	110	723,309	114	750,212	117	768,835
7000 - 8000..........	51	372,470	58	423,505	58	423,651	63	459,977	69	504,216	68	497,093
8000 - 9000..........	21	176,867	23	194,163	36	305,409	37	313,516	39	330,517	40	339,126
9000 - 10,000	21	201,630	25	238,488	27	257,151	28	266,944	28	266,947	31	297,326
10,000 Upwards....	20	247,869	22	281,669	28	359,234	35	435,490	39	490,283	42	529,423
Total	965	3,912,158	1,044	4,303,799	1,173	4,963,816	1,243	5,303,742	1,318	5,624,725	1,380	5,870,925

NOTE: The figures represent tonnages at the end of year.

The statistics after 1940 are omitted, as the Record of Registered Vessels during the War (1941 on to 1945) being not accurate.

JAPANESE MERCHANT VESSELS DURING LAST 16 YEARS

EXCLUDING VESSELS UNDER 100 G T

Average Per Month

Route	1930		1931		1932		1933		1934		1935	
	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T
Europe, South America, South Africa	....	580,575	....	521,414	....	706,808	....	629,869	81	591.484	71	524,430
North America	....	999,848	....	884,192	....	721,916	....	756,700	154	940.433	132	930,873
Australia, British India	....	350,703	....	490,106	....	397,414	....	394,378	61	387,963	76	459,287
South Seas, Near Sea	....	2,072,699	....	2,127,113	....	2,270,745	....	2,162,147	1,438	1,987,273	1,542	2,052,487
Docking, Repairing, Tied-Up Ship	....	312,299	....	253,516	....	158,131	....	136.483	35	157,653	25	106,348
Total	2,060	4,316,804	2,030	4,276,341	1,767	4,255,014	1,148	4,077,665	1,769	4,044,786	1,346	4,073,445

Route	1936		1937		1938		1939		1940		1941	
	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T
Europe, South America, South Africa	77	571.802	108	679,825	95	698,742	93	680,742	94	685,542	96	686,602
North America	142	1,003,716	145	1,017,133	128	926,859	129	937,157	139	1,022,859	142	981,059
Australia, British India	59	352,744	96	582,431	88	532,981	93	586,751	93	584,491	97	592,081
South Seas, Near Sea	1,626	2,238,847	1,680	2,296,084	1,918	3,188,036	1,990	3,288,158	2,261	3,719,118	2,352	3,914.388
Docking, Repairing, Tied-Up Ship	20	83,446	18	83,164	20	87,000	32	137,037	43	198,000	49	209,870
Total	1,924	4,250,555	2,047	4,658,637	2,249	5,433,618	2,337	5,629,845	2,630	6,210,000	2,736	6.384,000

Route	1942		1943		1944		1945	
	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T	No. of Vessels	G/T
Europe, South America, South Africa	....	....	....	....	....	....	....	....
North America	....	....	....	....	....	....	....	....
Australia, British India	....	....	....	....	....	....	....	....
South Seas, Near Sea	2,589	6,286,033	2,072	5,131,047	1,424	3,157,984	757	1,319,409
Docking, Repairing, Tied-Up Ship	(Unknown)		140	319,333	240	393.166	318	533,166
Total	2,589	6,286,033	2,212	5,450,350	1,664	3,551,150	1,075	1,852,575

be so many more mouths to feed. Of course, no such reluctance was apparent in shipping Chinese, Korean, and other liberated slave laborers out of Japan. The Japanese were terrified of them. In fact several instances occurred where the former slaves turned on their former masters in such a fashion as to give the latter good reason to want to get rid of them as quickly as possible. For instance, on one occasion, a group of Koreans who had been assembled at Sasebo awaiting repatriation broke into a small arms storehouse, armed themselves, and set out to solve the over-population problem of the Japanese. It was a pretty bloody affair until order was finally restored.

The repatriation and cargo programs were speeded by the delivery of about 100 liberty ships, 100 LST's,. and 9 C-1-MAV-1's for temporary use by the Japanese. This was a most interesting program, for it was not only an entirely novel way for a victor nation to treat a vanquished one, but also was accomplished under forms of documentation, operating regulations, terms of indemnity and other conditions which were entirely unprecedented in maritime affairs. Most of the liberty ships have now been returned. At the end of the first year, almost 5,000,000 out of about 6,500,000 Japanese had been repatriated. Phenomenal as this accomplishment is in the light of the vessels available, it probably could have been greater except for the inability to repatriate Japanese from the Russian-held areas. Recently some have been released, but 90 per cent of those still unrepatriated at the end of the first year were held in Manchuria, Northern Korea, Sakhalin, and the Kuriles. There have been recent indications that the Russians possibly intend to keep most of their still great number of Japanese war prisoners for forced labor—as a sort of human reparations in kind. The Supreme Commander's efforts to arrange for their repatriation are continuing, but are meeting with only indifferent success.

Of the persons to be repatriated from Japan to Korea, China, Formosa ,and other areas, well over a million had been returned—about 90 per cent of the total.

The mission of SCAJAP is nearing completion. As the occupation forces gradually withdraw from the field of detailed voyage-by-voyage control, and as private operators gradually take over more and more operating and management functions, subject only to general control, the sphere of the occupation becomes increasingly one of overall policy determination. The issues concerning long-range limitations on future Japanese merchant shipping are coming to the fore.

The Supreme Commander has commenced the organization of a Civil Transportation Section to control all forms of transportation. The blueprint of this organization, so far rather tentative, indicates that it will be principally composed of civilians, recruited from transportation industries here in America. So far as shipping is concerned, and to the extent that its recommendations may be accepted, this section may have a lot to say about the future of Japanese foreign trade for many years to come. Technically, initial recommendations as to the size and trading limits of the future Japanese merchant marine will probably be made by the Economic and Scientific Section of the Supreme Commander's Headquarters. These recommendations will probably pass through the Allied Advisory Council in Tokyo to the Far Eastern Commission in Washington for final decision, but it seems likely that the recommendations of the Civil Transportation Section, if vigorously proposed and supported, could receive serious consideration in this process.

Opinions in this country are by no means uniform as to the size and type of vessels which Japan may have the number of them, and the trades in which they may engage. In November, 1946, the recommendations of Reparations Ambassador Edwin W. Pauley were made public, in which he proposed that Japan be limited to a merchant marine of one and one-half million tons, with no vessels over 12 knots or 5,000 gross tons. Presumably, this figure excluded small craft of less than 100 gross tons and possibly excluded small wooden craft of somewhat greater tonnage. The proposal contemplated that 1,250,000 tons of this shipping should be limited to trade among the Japanese home islands, and that the balance should be limited to trade with Korea, China, Formosa and Dairen. No other foreign trade was to be allowed. He also recommended that only such shipyards be allowed the Japanese as were necessary to accomplish limited shipbuilding and to repair a fleet of the recommended size, plus such as are necessary to service foreign merchant vessels in Japan. This proposal seems in keeping with the generally accepted view, prior to termination of hostilities, that Japan was to be limited to a merchant marine sufficient only to maintain her basic economy and was not to be allowed to re-enter world trade as a major shipping nation.

Yet, not long ago, the inevitably anonymous "official sources" in Washington were reported in the papers as saying that Ambassador Pauley's proposal was too strict, that a greater fleet should be permitted, and that it should be allowed to operate outside the Far East. It was said that it would be impracticable to raise a geographic barrier if the Japanese economy is to be made self-sufficient. Apparently, this view is also held by some American officials in Japan.

The different ideas seem to turn on the interpretation of the Potsdam Declaration. One frequently hears reference to "minimum economy" as what was guaranteed by that Declaration. Perhaps it is worthwhile to review what it says. It confirms the Cairo Declaration limiting Japanese sovereignty to the four main islands—Honshu, Hokkiado, Kyushu, and Shikoku, and a few minor islands; it promises not to enslave or destroy the Japanese as a race or a nation; and then it says "Japan will be permitted to maintain such industries as will sustain her economy and permit the exaction of just reparations in kind, but not those which would enable her to rearm for war. To this end, access to, as distinguished from control of, raw materials shall be permitted. Eventually, Japanese participation in world trade relations shall be permitted." These words are important because the surrender was predicted upon them. It was not really unconditional. The words "minimum economy" do not appear. But notice that she is not to have industries which would "enable her to rearm for war." This is significant. In our many discussions with the Japanese about the war and why they lost it, the fact that they did not have adequate merchant shipping to allow them to take full advantage of the resources in the areas they conquered was always prominently mentioned. Of course, many other causes were given—inaccurate estimates of our productive capacity, the wrong guess that Germany would crush Russia, the belief that we would negotiate a peace, failure to cope with our submarines, and many others. But the shortage in merchant shipping was always emphasized.

In the Potsdam Declaration, we did promise that eventually Japan could participate in world trade relations, but that permission does not necessarily mean that this trade must be carried in Japanese vessels.

Words are easily molded to fit the wishes of the person relying upon them. So here the Japanese have interpreted these words as justifying a merchant marine sufficient to carry the goods necessary to "sustain her economy" in the way they would like to have it sustained. Needless to say, the figure far exceeds Ambassador Pauley's, and amounts to about 4,000,000 tons plus the shipyards to maintain and replace such a fleet, as compared to Pauley's one and a half million tons. A fleet of this size or one of three million tons, as it is rumored some American sources in Japan advocate, would obviously be needed only if Japan is to be allowed to re-enter unrestricted world trade. Now this is, of course, just what the Japanese are striving for, and quite understandably so. From the outset of the occupation, the Japanese who dealt with us were intensely curious about what sort of a merchant marine they were to be permitted to retain or acquire. They constantly urged the need for a large one.

Quite recently, the first authoritative decision came from the 11-nation Far Eastern Commission in Washington. After a long deadlock on reparations questions, the Commission acted upon American proposals concerning the level of industry to which Japan may return. This decision, reached in January, 1947, was not announced publicly until April, after General MacArthur's concurrence had been obtained. It fixes the future standard at the levels existing from 1930 to 1934, with some adjustments contemplated due to increase of population since those years. It sets 1950 as the year in which this level is to be reached. Specific applications of these

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aerial photo of San Francisco Naval Shipyard, taken April, 1947.

Photo courtesy of U. S. Navy, San Francisco Naval Shipyard, San Francisco, California

SAN FRANCISCO NAVAL SHIPYARD IN PERMANENT STATUS

THE NAVY'S YARD AT HUNTERS POINT, which was taken over 11 days after Pearl Harbor at a price of $3,000,000, now represents a nearly $100,000,000 national investment and has become an important, permanent unit of the nation's ship repair industry.

Captain Philip Lemler, U.S.N., shipyard commander, said the local shipyard has averaged between 40 and 45 vessels of all types in the months since V-J Day, as against a wartime average of 30 to 35 present at any time during the war. The time each ship is available in the shipyard is greater now. Without the additional battle damage work to augment voyage repairs, the work per ship is less, and the crewmen themselves are doing more of the work. (In wartime they generally left their ships to get rested, on "liberty".)

Indications are the San Francisco shipyard will continue to get a fair share of the Pacific Fleet repair work

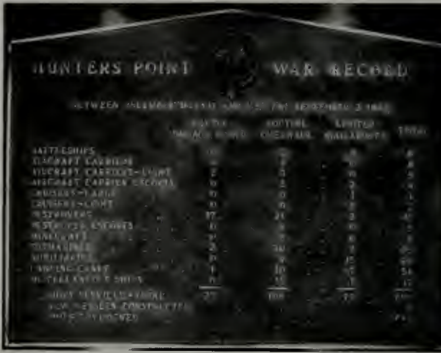
Captain Philip Lemler, U.S.N., present Commander of San Francisco Naval Shipyard.

even though the fiscal 1948 budget cuts the entire Navy repair and maintenance program.

The story of the growth and expansion of ship repair facilities at Hunters Point (Pacific Marine Review, October, 1945) does not end with the tremendous construction during the war. Present contracts, providing for a new power plant and additional berthing facilities for inactive reserve ships, are expected to run until April 30, 1948. Other major contracts, including ones covering the constructions of the world's largest crane, and the erection of a modern, fire-proof storage warehouse and a shipfitters' and boilermakers' shop, are expected to be completed by October of this year. The berthing facilities will be completely equipped to provide permanent service for 26 inactivated reserve ships, some of which are now taking space at repair docks. The remainder of the shipyard's new facilities, started as a wartime proposition, are being finished simply to the minimum necessary for effective peace time operations.

The Congressional Act of 1939 which enabled the Navy Department to take over Bethlehem Steel's facilities at Hunters Point remains in effect today, providing for the San Francisco yard to be run as an annex to Mare Island Naval Shipyard at Vallejo, some forty miles up the bay. This "great compromise" piece of legislation, as it is referred to in histories on the subject, makes the now self-contained and self-supporting Hunters Point yard look to Mare Island's shipyard commander in matters affecting facilities, personnel policies, and budget. In other respects, San Francisco Naval Shipyard's commander deals directly with the Bureau of Ships in Washington in technical matters, and with the Commander of San Francisco Naval Base in the Twelfth Naval District in military and logistics matters.

Secretary of the Navy James Forrestal gives the "word" to Reserve Fleet officers aboard the 27,000-ton carrier Intrepid. Former shipyard commander, Commodore J. W. Fowler, at right, has gone up to Industrial Survey Branch of Secretary's Office.



Shipyard's war record impressive on bronze plaques. Busy war work was done while shipyard underwent "growing pains." Past 21 months have seen slightly over 500 vessels berthed and drydocked.

General Order No. 223, issued at the war's end by the Secretary of the Navy, and which became effective November 30, 1945, reorganized the nation's eleven Navy yards into Naval Shipyards. The old Hunters Point Naval Drydocks became a full-fledged Naval Shipyard, if still tied by law to the Mare Island facilities.

Changes of Command

Since its hastened development after the outset of the war, the Hunters Point yard has had three commanding officers, each of whom has taken over at periods of major problems. The first, Captain (now Rear Admiral) N. L. Rawlings, who came to the yard from the Bureau of Ships in Washington, had the dual responsibilities of expanding the infant shipyard while executing wartime production. The 209 ships serviced and 661 drydocked for overhauls by V-J Day are a tribute to the 18,300 Hunters Pointers and the shipyard commander. His successor, Captain (now Rear Admiral) J. W. Fowler, came to the Point in October, 1945, from the Office of Assistant Industrial Manager in downtown San Francisco, where he had handled all ship repair work in private yards. His was the big task of rolling back the naval shipyard to a peacetime schedule.

The present commander, Captain Philip Lemler, U. S.N., came to the shipyard in August, 1945, as Production Officer, replacing Admiral Fowler when the latter became head of Industrial Surveys Division in the Office of the Secretary of the Navy. This job is to put the rolled-back operations on the most economical and effective basis possible.

"Magic Carpet" and After

During the 21 months since V-J Day, the first peacetime days of production this naval shipyard has known, the problems of becoming a top-flight voyage repair yard have been huge. Some of the larger headaches included reorganization as a separate component of the naval base; establishment of the San Francisco group of Pacific Reserve Fleet; inactivation, preservation, and decommissioning of ships; demobilization of naval manpower, and reduction of civilian crews from the 18,300 peak to the present 7500, and establishment of permanent civil service categories in place of wartime temporary service; absorption of the personnel and functions of the Assistant Industrial Manager's Office, involving the ship repair programs in 26 privately-owned Bay Area facilities; roll-back and continuation of various contracts and projects for the expansion of physical facilities; and utilization and disposal of war-expanded material inventories.

Immediately after the cessation of hostilities, the yard's attention was focused on reconverting and maintaining the so-called "Magic Carpet" fleets which were to bring U. S. troops home. This "super-rush" project, which captured the nation's imagination, was given top priority and the repair functions of San Francisco Naval Shipyard were heavily-loaded with the work of preparing transports. It became the task of the yard to convert CV's, CVE's, CVL's and many other types of vessels, and to do emergency repairs on such former commercial vessels as the Matsonia, Lurline, Brazil, and others of the "Magic Carpet." The speed at which this repair and reconversion program was done was in no small way responsible for the speed in returning American troops to the mainland. Reconversion consisted mainly of setting up thousands of bunks, sanitary facilities, and messing and cooking gear, plus fast overhauls of evaporating plants for the overcrowded troops' water supplies.

Inactivation

First on the ship inactivation program was the job of laying up submarines, many of which had been long overseas and were the first vessels not needed at war's end. These were sent, after repair at the San Francisco yard, to reserve berths at Mare Island.

February, 1946, found the ship repair crews concentrating on the inactivation of destroyer escorts. Twenty of these craft went through the process of having all machinery in process of preservation, securing all seaward passages, preparing the underwater hulls for extra coats of special anti-corrosive and anti-fouling paints, and putting "envelopes" on all topside machinery and armament, this last employing the recently developed dehumidifying process.

After the DE's, two Essex class carriers, the Hornet and the Intrepid, both with enviable war records, were preserved and permanently berthed in the reserve "mothball" fleet at the yard, and two smaller carriers, the Belleau Woods and San Jacinto, were prepared for their Alameda berths. Complete overhauls and inactivation of

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At top: The Hunters Point Yard's busier-than-wartime water front, with heavy cruiser Los Angeles in dry dock and another large crane at right, is now handling between 40 and 45 fleet units at a time. The shipyard now employs 7500 people, giving it a payroll of approximately $1,600,000 a month, and making it the city's largest single industry.

Center: Four personnel transports (PA's) up in drydock No. 4 for hurried overhauls before going into the postwar "Magic Carpet" run.

At bottom: World's mightiest crane (500 ton) towers over personnel transports and aircraft carrier U. S. S. Hornet (background), as it nears completion. Project, including huge regunning mole on which it stands, was created where swift tides formerly rounded Hunters Point, at a cost of nearly $10,000,000.

. . . With The Port Engineers . . .

PROGRESS IN BOTTOM PAINT FORMULATION

By F. J. DANNENFELSER, Vice President Manning-Mitchell, Inc., San Francisco

Left to right F J Dannenfelser vice president B M Wolfe president and H M Brez Research Director of Manning Mitchell Company Mr Dannenfelser presented the paper on bottom paint formulation at the May 7 meeting of the San Francisco Society of Port Engineers

J A Riemers secretary treasurer Society of Port Engineers of San Francisco, Ray Sample, Matson Navigation Company, member of the board of Governors of the Port Engineers, and Harry Martin of Moore McCormack on Education committee of the Society

THE ACTUAL PAINTING OF SHIPS and ship-bottoms is one of the oldest arts or professions in the world. The earliest mention of fouling was by Aristotle in the 4th century B. C. There is record of the use of the first antifouling paint, a mixture of arsenic and sulphur in oil in 412 B. C. Lead sheathing was used by the Greeks as early as the 3rd century B. C. and surprisingly enough remained in semi-acceptance until about 1500 when Spain adopted its use and it then spread to France and England. The British Admiralty used it universally from 1660 to 1680 until its corrosive effect on iron caused its abandonment. There is considerable mystery surrounding the use of copper sheathing. Copper foundries of the 10th century B. C. have been excavated and copper was a staple in trade in 800 B. C. Thin sheets of copper were popular in use for roofs from the 12th to the 15th centuries, although no authentic case of sheathing ships with copper prior to the 18th century has been established. It is very difficult to understand how the use of lead sheathing persisted when copper was available. The British Admiralty adopted use of copper in late 1700's, and the first ships built for the U. S. Navy under the Naval Act of 1794 were coppered. The Constitution, Fulton's submarine and the Clipper ships of about 1850 and later the whalers were all coppered.

With the advent of iron ships, it was found that copper sheathing could not be used because its electrolytic action corroded the hull dangerously. The British Navy lost one naval vessel, and nearly lost another. Various insulating materials were tried to prevent the electrolysis,—felt soaked in tar; cork; rubber; and even wooden sheathing. The expense was prohibitive so attention was turned again to antifouling compositions.

(Presented May 7, 1947 before the Society of Port Engineers of San Francisco.)

AT LOS ANGELES

George F. Walters of Oxi Corporation Speaker at Port Engineers Meeting

With President Paul V. Gaudin presiding, another highly successful meeting of The Society of Port Engineers at Los Angeles Harbor was held May 7th at the Lafayette in Long Beach. Vice President Leonard E. Landers assisted in conducting the meeting.

George F. Walters, president of Oxi Corporation of Gary, Indiana, was speaker of the evening. Mr. Walters described the chemical reactions of soot eradicators and also the Oxi chemical cleaning process. He explained the chemical reaction of combustion and how and why soot forms; how hard deposits plug the tubes, and how sulphuric acid forms and chemical reactions take place. His talk was accompanied by demonstrations of chemical reactions. An insulating test of carbon was made as part of the program.

Mr. Walters also exhibited the Oxi metering injector which controls the amount rate of feed per hour and also controls the distance Oxi is sprayed from the end of the pipe. He explained the corporation's engineering service aboard ship and how boiler efficiency is checked, pointing out that each member of the Oxi staff carries a chief engineer license.

Leonard E. Landers, Port Engineer At Los Angeles for APL

First of a series on important Port Engineers of Los Angeles Harbor.

In talking with "Len" Landers and asking many question we learn that he was born in Memphis, Tennessee. He came out to the Coast in 1920 and for three years attended Washington State College.

Landers first went to sea as Engine Room cadet in the President Jackson and President McKinley of the Admiral-Oriental Line, Seattle to the Orient run, from 1923 to 1927.

He served in various capacities aboard vessels of the Tacoma-Oriental Line from 1926 to 1928. Then aboard the Transpacific ships, President Lincoln and President Taft, under Chief Engineer George Jackson. His next sea service was in vessels of the United States Lines and then the Grace Lines, 1933 to 1935 with widely-known Chief "Bill" Sykes. Landers served as Chief Engineer in charge of various equipment at the Panama Canal for five years.

His next work was for the University of California on research work on welded ships in the early part of the war. He entered the shoreside Engineering Staff of American President Lines early in 1944, at San Francisco. He was transferred to Los Angeles Harbor as Port Engineer at that port in October, 1945. He is married and lives in Long Beach.

His hobby? You named it. Ships—large and small.

Mr. Landers is vice president of The Society of Port Engineers at Los Angeles Harbor.

While lead and copper sheathing were in popular usage, a series of ineffective coatings were developed. Fishermen near Palestine used a mixture of crude turpentine, resin, suet and asphalt in the 17th century. Several compositions were tested comparatively in England in 1737 and the best was a mixture of pitch, tar and brimstone, and was effective only against worms. With the growing use of iron ships in the 19th century, more and more antifouling compositions came into being. By 1865 more than 300 patents for bottom paint had been granted in England alone. Most were useless or worse. Admiral Sir Edward Belcher said they seemed designed to encourage fouling rather than to discourage it. The most effective bottom paints contained copper, mercury and arsenic or compounds of the same. Sea weed, poison ivy, poison juice from a Javanese tree and powdered oyster shells were all patented as toxic ingredients for antifouling paints.

The best of the thousands of formulations in the late 1800's seem to have been the McInnes and Italian Moravian hot plastics and Tarr and Wonson's copper paint, although fouling remained a major problem. The U. S. Navy prior to 1908 bought all bottom paints on com-

Above photograph shows condition of underwater body of U. S. Army transport Admiral W. S. Benson during emergency dry docking at United Engineering Company after seven months exposure of Manning Mitchell's Shipping Copper cold plastic in prolific fouling waters of Australia, Japan, and the Philippines.

This photo shows Pacific Far East SS Midnight immediately after being painted with Manning Mitchell's shipping marine finishes in San Francisco Bay.

petitive bidding with no specifications, the only check being to count the number of cans delivered against the number ordered, but began manufacture of their own paints in 1908. There is no question but that they have definitely led the world in research and improvements, particularly since 1922 when they were successful in their first plastic paints.

During the same period, a myriad of devices were patented, some employing electricity, chlorine and other gases; others used chains, knives, brushes, and rubber with nail points protruding. Patented coating materials included cork, rubber, cement, paper felt, paraffin, pulverized felt, glass and luminous coverings. Thomas Edison was issued a German patent in 1891 for an electric antifouling system using a d. c. generatotr feeding electrodes under water so as to send electric currents back to the hull to prevent organism attachment.

The recent war naturally accelerated the antifouling paint research program. It is estimated that the United States Navy spent some 6 million dollars in this program. Great strides were naturally made. Leading Naval authorities have acclaimed the development of the plastic paints as the most important contribution to the effort of defeating the Japanese with the possible exception of radar. It would have indeed been a difficult decision for a task force commander to either operate his force at 15 per cent reduced top speed requiring as much as 40 per cent additional fuel, particularly with the shortage of tankers, or to weaken that force by sending each unit to the states for drydocking each 6 or 9 months. The Navy now makes absolutely no allowance in their new vessel design for reduced speed or additional fuel consumption for periods in excess of 12 months as both are negligible. This is a tremendous advancement.

At the conclusion of hostilities, the Navy had two effective coatings, a hot and a cold plastic, both of which gave excellent performance, but only if and when they were properly applied. Neither paint is easily applied, and both have certain commercial limitations as they are made for Naval use. The hot plastic is normally packaged in a 600-lb. solid mass, must be broken with an ax, reduced at one time to insure uniformity in a heated kettle, drawn off, transported as a liquid to a spray pot, reheated to proper temperature and pushed through an electrically heated hose to an electrically heated gun and applied to the ship bottom. At no time in the entire operation may the material be heated above a critical temperature or its antifouling properties are destroyed. The best equipment that the Navy as well as commercial manufacturers have been able to develop for this purpose is not as yet approved by the insurance underwriters, and there is some danger inherent in its use. At best, its spray operation is slightly better than a garden hose nozzle. The paint itself is limited in its use since it cannot be used at temperatures below 40°F. and use in the 40° to 50°F. range is dangerous since adhesion is often poor. When exposed to the sun's rays or to ship internal heat, there is considerable danger that the coating will run and sag. A final disadvantage is the cost factor. It is impossible to apply a pinhole free coating in thicknesses of much less than 30 mils or about 6 to 10 times that of conventional paints. Only the few mils at the surface are required to furnish the necessary toxic ingredients while the remainder of the expensive copper salt is not used.

The cold plastic as used by the Navy during the war also has its disadvantages. The paint is so designed that it is difficult, if not impossible, to maintain complete manufacturing control. As a result, the paint varies in viscosity from normal limits to that of a putty-like paste. It is usually very heavy and requires special pumping equipment to spray or else it must be thinned or heated. If thinned, the film strength is reduced and performance is varied. If heated, again there is serious danger of completely eliminating all antifouling properties by overcooking the resin.

During the past few years, we in the marine paint industry have gone through a transition period very similar to that of Radar. Radar was a war development but with many commercial limitations due to its cost, weight and size. Now it appears that subsequent research has made possible a light weight practical unit at a small cost so that even the commercial airlines are now making installations.

Similarly, with antifouling paints. Members of Manning-Mitchell research division have a vast background in this field, having held the key positions in the government's plastic paint program. Research during the past two years has been directed at the development of a product competitive to other commercial coatings, and at the same time incorporating all of the advantages of the Navy hot and cold plastic formulas, but eliminating the many application difficulties, hazards, and costs.

Such products are now on the market. They have been designed so that they can be applied in a one-day drydocking period without the necessity of sandblasting. Normal hull cleaning is sufficient. No bare metal primer is required since the anticorrosive serves as both an anti-

(Please turn to page 107)

At right: Shipping Copper being applied to Pacific-Atlantic's Jose Pedro Verella. ▶

At right, bottom: Manning-Mitchell Shipping "A.C." anticorrosive being applied to "Harmac Chemainus." ▶

▼ Below: Shipping Copper being applied to Pope & Talbot's Laura Bridgeman.

COMPARATIVE WAGE SCALES — American vs. Foreign

The National Federation of American Shipping Has Developed Vitally Important Wage Charts

IN THE APRIL PACIFIC MARINE REVIEW there appeared wage charts for the *licensed* personnel in American and Foreign service. The National Federation of American Shipping, which prepared these charts, has amplified them with additional tables showing the comparison between American and certain Foreign *unlicensed* personnel. It is thought in some quarters that the great disparity between American and Foreign wage scales is responsible for the trend toward registry under the flags of Panama and Honduras. To some extent this may be so, but the major registrations under foreign flags have other causes. Mr. McCullough's analysis herewith is particularly timely.

The Research Report on Panamanian-Honduran Merchant Fleets

By JAMES A. McCULLOGH, *Director of Research and Statistics,*

National Federation of American Shipping

The absurdities and inaccuracies of the recent press publicity over the tremendous growth of the Panamanian and Honduran fleets led to the compilation of evidence for the Federation to support the following conclusions. Here they are in summary:

"1. Aside from special cases, the established American shipping companies have shown little interest in Panamanian/Honduran operations.

"2. The American shipping industry *as a whole* has little to gain from such operations. As these fleets continue their lopsided expansion, new problems will develop which are not now apparent.

"3. The growth of Panamanian operations has already stirred up some extraordinary frictions within the maritime unions throughout the world. Jurisdictional outbreaks on the international basis are not inconceivable.

"4. There should be no apology for our investment in Panamanian/Honduran operations. In certain cases it would be economic folly and clearly inconsistent with national interest if some of our companies did not invest in foreign flag ships.

"5. The real advantages of Panamanian/Honduran operations are frequently much greater for foreign owners than American owners and, in consequence, American interests now own a somewhat smaller proportion of the Central American fleets than they did in 1929. Panamanian/Honduran operations are particularly attractive to the Greeks.

"6. From the standpoint of the American shipping interests as a whole, the growth of the Central American fleets is not the special problem that many people suppose. The control of millions of tons of shipping is now in the process of shifting from the United States to foreign countries, some of which maintain wage standards about as low or even lower than the Panamanian. By focusing our attention on one facet of our long-term problem, we tend to lose sight of the problem as a whole."

Ranking of Largest Maritime Nations

From September 1, 1939 to the end of 1946 Panama ranked eighth in size among the maritime nations of the world and at the moment appears to have an even higher rank. On the assumption that ship sales will materialize from all applications approved by the Maritime Commission, the Panamanian fleet will ultimately approximate 2.7 million deadweight tons. Panama would then rank sixth as shown below, and might be among the first five:

				Projection
U. S.	12/31/46	28,000,000	Ultimate	11,000,000*
U. K.		18,700,000		21,500,000
Norway		4,600,000		7,100,000
Netherlands		2,500,000		3,300,000
Sweden		2,300,000		2,600,000
France		1,900,000		3,200,000
U. S. S. R.		1,800,000		2,300,000
Panama		1,800,000		2,700,000
Canada		1,600,000		1,700,000
Spain		1,300,000		1,400,000
Greece		1,100,000		2,200,000
Denmark		1,100,000		1,500,000

* Basic NFAS projection assuming no real solution of our domestic shipping and other fundamental problems.

Who Owns Panamanian Fleet

As appears in table below, U. S. interests now own a somewhat smaller proportion of the consolidated Central American fleets than in 1939. This relative loss will be restored in part by subsequent deliveries of war-built vessels for which applications have already been approved.

PANAMANIAN/HONDURAN FLEETS

		Sept. 1, 1939		Present
Panama—U. S. Owned		583,600		1,008,800
All Other		522,000		1,184,300
Honduras—U. S. Owned		74,200		91,500
All Other		16,300		241,300
Total U. S.	(54.9%)	657,800	(43.5%)	1,100,300
Total All Other		538,300		1,425,600

A total of 78.2 per cent of the American-controlled Panamanian/Honduran vessels are owned by five American companies which have extensive investments abroad. These countries have large investments in the Caribbean area itself. Some carry on extensive cross trade operations which competitively cannot be handled in American flag ships, for the fact that crews would be required to stay away from the U. S. for long periods. Based on experience in shipping it is doubtful that American seamen could be persuaded to sign on such vessels in any case.

We should not make the mistake of focusing our attention on size of the Central American fleets in looking at the basic problem of the American flag industry. Already our fleet has dropped from the postwar peak of 43 million to around 29 million dw tons today. Unless something is done to correct certain of the obvious operating disadvantages of American flag ships, it can be assumed that our fleet will drop ultimately to a level of only about 11 million dw tons. In a drop of this magnitude, the Panamanian development is a relatively small factor.

The manning scales on the next page clearly point up the sharp differences in cost and the competitive position in which American shipping must operate.

MANNING SCALE AND WAGE DATA

BRITISH FLAG LIBERTY SHIP

	Rates per Month	War Bonus	MOWT Special Gratuity	Pension Fund Employer's Shares (18c in $4.04) of Wages Paid	Health Pensions & Unemployment Insur. Payable by Employer	Monthly Leave Allowances Off: 2½ days Rat: 2 days	Total per Month
Master	$ 234.32	$ 40.40	$14.72	$ 8.80	....	$ 18.90	$ 317.14
Chief Officer	126.24	40.40	....	4.74	....	10.18	181.56
2nd Officer	94.92	40.40	....	3.54	....	7.66	146.52
3d Officer	74.72	40.40	....	2.80	....	6.04	123.96
Chief Engineer	170.20	40.40	....	6.40	....	13.74	230.74
2nd Engineer	126.24	40.40	....	4.74	....	10.18	181.56
3d Engineer	94.92	40.40	....	3.54	....	7.66	146.52
4th Engineer	70.68	40.40	....	2.62	....	5.68	119.38
5th Engineer	68.68	40.40	....	2.58	....	5.56	117.22
Radio Officer	88.88	40.40	....	3.32	....	7.14	139.74
Boatswain	64.64	40.40	....	....	$ 1.42	4.20	110.66
Carpenter	69.68	40.40	....	....	1.42	4.50	116.00
5 A.B.'s @ 56.56	282.80	202.00	....	....	3.10	18.16	506.06
2 Sr. O S's @ 40.40	80.80	80.80	....	....	2.84	6.20	170.64
2 Jr. O S's @ 34.32	68.64	80.80	....	....	2.84	4.24	156.52
Deck Boy	20.20	20.20	....	....	1.04	1.32	42.76
Donkeyman Greaser	63.00	40.40	....	....	1.42	4.08	108.90
3 Greasers @ 60.60	181.80	121.20	....	....	4.30	11.68	318.98
3 Firemen Water Tenders @ 60.60	181.80	121.20	....	....	4.30	11.68	318.98
Fireman	58.56	40.40	....	....	1.42	3.76	104.14
Chief Steward	78.76	40.40	....	....	1.42	5.08	125.66
2nd Steward	54.52	40.40	....	....	1.42	3.52	99.86
2 Asst. Stewards @ 52.52	105.04	80.80	....	....	2.84	6.80	195.48
Ship's Cook	70.68	40.40	....	....	1.42	4.52	117.02
2nd Cook	54.52	40.40	....	....	1.42	3.52	99.86
Galley Boy	20.20	20.20	....	....	1.04	1.30	42.74
Total 37	$2,605.44	$1,454.40	$14.72	$43.08	$33.66	$187.30	$4,338.60

NORWEGIAN FLAG LIBERTY SHIP

	Rates Per Month	War Bonus	Health & Accident Insurance Payable by Employer	Leave Allowance Per Month	Total per Month
Master	$ 248.00	$ 50.00	$ 2.80	$ 26.23	$ 327.03
Chief Officer	124.60	50.00	2.80	10.87	188.27
2nd Officer	92.80	50.00	2.80	8.57	154.17
3d Officer	70.80	50.00	2.80	6.98	130.58
Radio Officer	80.00	50.00	2.80	6.53	139.33
Boatswain	54.80	50.00	2.80	4.85	112.45
Carpenter	57.80	50.00	2.80	4.85	115.45
4 Able Seamen	204.80	200.00	11.20	18.46	434.46
4 Ordinary Seamen	136.80	200.00	11.20	13.92	361.92
Young Man	25.00	50.00	2.80	2.27	80.07
2 Deckboys	32.00	80.00	5.60	4.53	122.13
Chief Engineer	158.00	50.00	2.80	13.28	224.08
2nd Engineer	118.40	50.00	2.80	10.42	181.62
3d Engineer	98.00	50.00	2.80	8.94	159.74
Assistant Engineer	64.60	50.00	2.80	4.51	121.91
2 Donkeymen	109.60	100.00	5.60	9.71	224.91
6 Oilers/Firemen	212.40	300.00	16.80	21.36	550.56
Eng. Boy	16.00	40.00	2.80	2.27	61.07
Steward	96.80	50.00	2.80	8.42	158.02
Cook	65.20	50.00	2.80	5.55	123.55
3 Aux. Boys	60.00	150.00	8.40	7.60	226.00
Total 36	$2,126.40	$1,770.00	$100.80	$200.12	$4,197.32

AMERICAN FLAG LIBERTY SHIP

	Basic Wages per Month	Supplemental Wages*	Total Labor Costs
Master	$ 616.00	....	$ 616.00
Chief Officer	361.00	$ 179.66	540.66
Second Officer	316.00	145.10	461.10
Third Officer	290.00	138.70	428.70
Boatswain	205.00	78.65	283.65
A. B.'s	6 @ 172.50	6 @ 82.34	6 @ 254.84
Ordinary Seamen	3 @ 150.00	3 @ 80.04	3 @ 230.04
Deck Maintenance	187.50	56.35	243.85
Purser-Pharmacist Mate	267.50	....	267.50
Radio Operator	254.00	63.56	317.56
Chief Engineer	574.00	....	574.00
First Asst. Engineer	361.00	155.34	516.34
Second Asst. Engineer	316.00	147.66	463.66
Third Asst. Engineer	290.00	141.26	431.26
Deck Engineer	205.00	52.91	257.91
Oilers	3 @ 177.50	3 @ 70.84	3 @ 248.34
Firemen/Watertenders	3 @ 177.50	3 @ 69.69	3 @ 247.19
Wipers	2 @ 175.00	2 @ 13,80	2 @ 188.80
Chief Steward	220.00	116.87	336.87
Chief Cook	205.00	95.42	300.42
Second Cook & Baker	185.00	74.29	259.29
Messmen or Utilitymen	5 @ 150.00	5 @ 69.69	5 @ 219.69
Total 38	$ 8,503.00	$ 2,977.57	$ 11,480.57

* Cargo Bonus Included but War Risk Bonus Excluded.

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

Manila as a Distribution Point

By J. F. MARIAS

SHORTLY AFTER THE END OF THE FIRST WORLD WAR, we who are interested in developing and expanding world trade went thru the very same searching of ideas and planning that we are doing today. There is nothing new about it but at least we now have an advantage over our former calculations. We have the experience which we did not then have and we now can correct the mistakes we made then, if we only will. We can put our second guessing to work.

At that time we had surplus ships, as we have now. We had ambitious steamship owners and operators, as we have now. We had new enterprises and expanded industries, as we have now. All were then looking for that so-called "bright-future" and that is what they are doing today. However, among these were the greedy, the ignorant and the near-sighted. They wanted something big, and they wanted it quickly and with large profits. To some degree they were successful but the permanent expectations did not entirely reveal themselves. We hoped for the tremendous possibilities of the Oriental markets but we sent too many salesmen and too many delivery boys, each carrying too many small orders. We placed a large number of ships on the berths from all the main ports of the Pacific and many duplicated the others in ports of call. They each carried a little. The American taxpayer paid their operating losses by subsidies. There was no *overall* program and there is as yet none today. Unfortunately our inborn individualism—or perhaps just plain stupidity, or jealousy—seems to preclude joining in on a program. If the Government attempts to provide it there is criticism of all sorts—too political—bureaucratic—inefficient, and infringing on private prerogatives. If the Government does not do it, it is criticized for not showing leadership,—being without a foreign economic program—asleep at the switch an so on.

J. F. Marias

An old story covers this attitude fairly well. A city gentleman was strolling in the country one day and saw a lad digging potatoes. Being curious, he leaned on the fence and asked the boy what he got for digging the potatoes. The lad replied, "Nothing if I do, and hell if I don't."

While the United States was in control of the Philippines, we had a far better opportunity of developing a "Gateway to the Far Eastern Markets" than we have today; but, strange as it seems, only now are we thinking what a fine thing it would be. Before July 4, 1946, when the Philippines was given its independence, we frequently referred to the possibility, but like our attitude toward the weather, we didn't do anything about it, except critize those who saw the possibilities for the future.

For instance, when independence was discussed, some of us inserted in our recommendations that we, the United States, should have a spot of land in fee ownership where we could conduct our commercial gateway—where we could have warehouses, assembly plants, repacking facilities, docks, offices, etc. In a way we thought that we could set up our own little United States in the Orient, much as England has a little England at Hong Kong. We also thought that this little territory could be a small token from the Philippines to the United States. Furthermore, we could have whatever military base our military authorities thought necessary. Only recently we concluded our military bases deal with the Philippines Government. Certainly these military bases in the Philippines are not for the protection of the Philippines, nor are they our protection against the Filipinos. They are precautionary installations to augment our protection program on a world wide basis. Then why not consider a program for our *economic* protection on a world wide basis?

If we had been granted this area, which some of us recommended as Subic Bay just at the northern end of the now famous Bataan peninsula, we would have had a protected Bay, plenty of land, and in no way would we have interfered with any of the economy of the Philippines. We would have built our own port facilities, etc. Subic Bay was actually an American base and had been for many years. It was the base for the famous Dewey Drydock which was towed across the Pacific for the exclusive use of our Navy, although when necessity demanded, our merchant ships used the facilities.

The late President Quezon opposed giving us any property in fee ownership. He countered by telling us that we could have as much land as we would require for "Free Zones" in any and all of the ports in the islands. This showed his lack of appreciation of the importance of our foreign trade. It was pointed out to him that if Free Zones were established, they would still be subject to the laws of the Philippines and what we needed was an area subject only to American law.

On the other hand the present president, Manuel Roxas, was not at that time unfriendly toward the idea. He was the head of several important study groups at the time this and other ideas were suggested. What was missing was a concerted effort on the part of the United States—both government and industry. We allowed our military and political people to control our thinking, if there was any, in the interests of commerce. Unless those directly concerned take greater interest now, we are wasting time and words even discussing the possibilities.

At another time, during the Harding administration, the idea was also discussed along with the extension of the coastwise laws to the Philippines. Our Congress had actually passed the law but it was in a permissive manner; that is, its application was subject to a proclamation of the President. He never made it—thanks to three prominent objections: 1. Foreign opposition; 2. Philippines' fear that it would retard Independence and 3.

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THE WORLD TRADE CONFERENCE AT SAN FRANCISCO
At the speaker's table are the following: Alvin Eichholz, Lyford Morris, Earl Fisher, Arthur Poole (Chairman), Steven D. Bechtel, Fred Galbreath, George Smith, Leland Cutler, and Mrs. Henry Dibble, Jr.

A PROGRAM FOR EXPANDING THE WEST'S WORLD TRADE

By STEPHEN D. BECHTEL, President, Bechtel Corporation

NEVER IN THE HISTORY of the world has there been a more worldwide unbalanced supply and demand of real necessities. The destruction from World War II overseas, the conversion of American factories to war munitions and weapons, and the creation of the world's greatest production machine, have resulted in a worldwide pattern of surpluses and shortages. Two-way world trade can balance that demand by replenishing depleted U. S. natural resources, and furnishing foreign lands with foodstuffs, machinery, products, and the technical skill they urgently need.

The policy of Internationalism must be put into action if we are to block the expansion or acceptance of communistic views which are being pressed upon the peoples of many parts of the world. Food, materials, equipment, and "know how" of American producers and business organizations must be supplied overseas, if we are to avert the spread of communism and other nationalistic trends that oppose an American system of free world trade and private enterprise.

It is recognized worldwide that the ports of San Francisco, Los Angeles, Portland and Seattle are among the finest in the world. The West has many of the finest industrial organizations and the largest shipping companies operating in global commerce today.

Many Western and Bay Area producers are spurring their efforts to expand foreign exports, according to a world trade survey by the San Francisco Bay Area Council, covering the major industries in the nine Bay counties. The Council study revealed that exports are on the upgrade, with manufacturers reporting more than two to one that exports are on the increase over last year, and three to one reporting gains for 1947 over 1941.

Senior executives of U. S. industry should be familiar with world needs and opportunities, studying foreign sources of raw materials as well as foreign markets for their products.

World trade develops a matter close to the hearts of all of us—the encouragement and maintenance of our great American system of free enterprise as contrasted to socialism or nationalism of life and leadership.

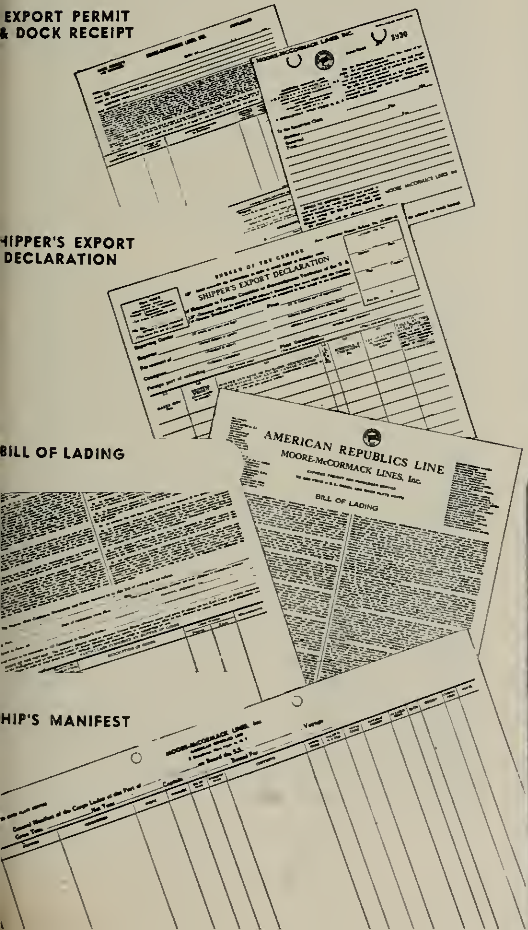
As an illustration, Standard Oil Company of California, together with the Texas Company, will spend hundreds of millions of dollars in the Middle East to develop for-

(Please turn to page 125)

Pacific
WORLD
TRADE

IT TAKES DOCUMENTS AS WELL AS SHIPS TO EXPORT GOODS...

The ships you can see . . . but the maze of paper work involved in handling a shipment . . . regardless of size or bulk . . . proceeds with quiet efficiency behind the scenes. For instance, Moore-McCormack's clerical staff is numbered in the hundreds . . . all handling the forms, statements and records essential to meet government regulations and assure proper control of commodity movements.



EXPORT PERMIT
& DOCK RECEIPT

MOORE-McCORMACK LINES, Inc.

3930

HIPPER'S EXPORT
DECLARATION

BUREAU OF THE CENSUS

SHIPPER'S EXPORT DECLARATION

BILL OF LADING

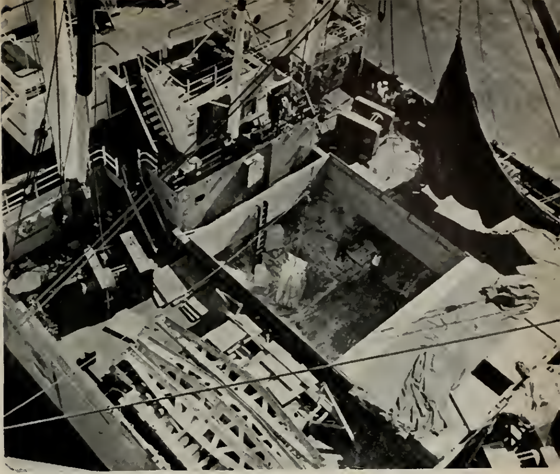
AMERICAN REPUBLICS LINE

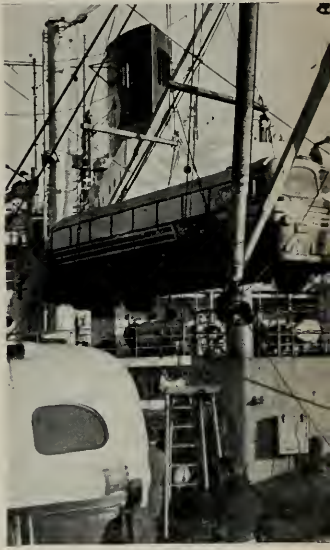
MOORE-McCORMACK LINES, Inc.

BILL OF LADING

HIP'S MANIFEST

MOORE-McCORMACK LINES, Inc.





TOP:
Cargo must be handled in many ways; and the ship's equipment must be equal to every contingency. Here uncrated automobiles are loaded by special platform-type sling.

CENTER:
Proper stowage and placement of cargo call for knowledge and experience of a high order; here, motor buses for Brazil form an unusual and bulky item of deck cargo.

BOTTOM:
The long voyage across Equatorial waters places special emphasis on refrigeration. Moore-McCormack cargo liners provide thousands of cubic feet of refrigerated space, with the most modern of controls.

Admiral Smith Analysis

(Continued from page 48)

smaller and less expensive passenger liners instead of the super-liners. In either case we would add to the whole program the 36 long range vessels in service or under construction as of December 31, 1946, making the final totals of 101 and 103 respectively.

It is proposed to spread the cost of this program, including new construction and betterments, over several years. Beginning in 1948, and extending beyond 1952, the total cost of the program would be $635,000,000 if based on Plan Number One—calling for the four super-liners—or $571,000,000 if based on Plan Number Two—calling for six smaller liners. It is proposed that the shipowners be required to pay the Government upon delivery of each vessel a minimum of 25 per cent of the sales price to the owner, where construction subsidy is allowed, and a minimum of 12½ per cent of the sales price (or the actual construction cost) where no construction subsidy is allowed. The balance of the sales price to the owner would be spread over a 20-year life, with interest at 3½ per cent per annum.

In addition to this program, which would begin in 1948, there are certain interim requirements which should be provided for; that is, vessels in addition to those now in operation or under construction needed to carry on until the proposed new vessels can be placed in operation. These requirements involve a total of 34 vessels, 19 of which were in service as of December 31, 1946, and 15 of which will be needed in addition. This tonnage can be made available if Congress approves the $50,000,000 reconversion item included in the Commission's budget for the fiscal year 1948.

You may also be interested in a few details about the Commission's permanent long range program—as differentiated from the immediate long range program—particularly in so far as it affects Pacific Coast shipping interests. The permanent long range program, which is based on the need for adequate American flag passenger and combination passenger-cargo tonnage to serve the principal trade routes of the world in the interest of maintaining trade and commerce and aiding the national defense, involves construction which would not begin until 1954.

This program is so far in the future (in fact, the majority of the ship building contracts would not be let for 15 to 20 years) that it is impossible at this time to estimate the construction costs, but the tonnage of vessels is based on that of ships now in operation or proposed for immediate construction. Here again we have two alternative plans, Plan Number One proposing six super-liners, two each for the transatlantic, transpacific and South American trades; and Plan Number Two proposing eight smaller liners. Take your choice. The program calls for 94 modern passenger and combination passenger and freight vessels under Plan Number One, or 96 under Plan Number Two, serving the principal trade routes of the world by 1954. Of these, 73 would be in the foreign trade, 14 in the domestic non-contiguous trades, and 7 in the coastwise trades. Thirty-five of the ships are now available; the remainder would have to be built.

So far as Pacific Coast shipping is concerned, the Maritime Commission recommends the following under the permanent long range program: two new express type or three fast passenger vessels for the California to Japan, China and Philippines trade; seven combination passenger and cargo vessels for the round-the-world trade; two combination vessels for the California to Australia trade; two passenger vessels (one of them new) for the California to Hawaii trade; two special type passenger vessels (they probably will have to be new ones) for the Hawaiian inter-island trade; three new special type passenger vessels for the Pacific-Alaska trade; two passenger trailers to provide a new service to transport trucks, passenger automobiles and passengers between Los Angeles and San Francisco; and two passenger vessels (they should be new) for the Los Angeles-Catalina Island run. We also propose, for interim operation, two P2-SE2-R3 type vessels (designed as troop transports but converted to passenger vessels) to operate between California and the Far East. These would restore transpacific passenger service pending construction and placing into service of permanent suitable passenger ships.

Let me emphasize that the fleet envisaged under this permanent long range program will be a modern fleet, composed of the safest ships in the world. No vessel over 20 years of age is included in the plan. While the 94 or 96 modern passenger vessels called for will be numerically smaller than the fleet of 127 American flag passenger vessels in active operation at the outbreak of the war, they should actually present a greater annual passenger carrying capacity by virtue of their greater speed. The plan contemplates that in no important trade will passenger sailings be less frequent than before the war, and the superior type of vessels will place the American flag passenger fleet in a much stronger competitive position and add to its value for national defense.

As Pacific Coast shipping people look forward to the day when their services will be firmly established more or less along the lines I have just described, the time is now, it seems to me, for them to make sound plans of their own for the future. Compared to the operators in the Atlantic, who from the earliest postwar days have had to pit themselves against steadily mounting competition from rapidly growing European services, you Pacific operators have a relatively clear field before you. You have, in addition, the opportunity to capitalize upon the

Pacific WORLD TRADE

war-produced industrial boom of the West Coast, a good share of which may be expected to remain here permanently to enrich this entire region. An expansion in trade should certainly follow this industrial expansion as a natural sequence.

These new West Coast industries should be able to find good markets in the Far East. New American steamship companies have already been formed to engage in transpacific operations, and old established companies are seeking to expand their operations. You can expect, of course, some foreign competition, particularly for that prize of some half a million tons of shipping which seven Japanese lines carried prior to the war. Those seven lines will probably never return to annoy you, but you must bear in mind the fact that eight other lines—half of them American and the others Canadian and Scandinavian—entered the trade as soon as the shooting was over in Japan.

You should be more familiar with this situation than I am, but from where I sit in Washington it looks right now like a toss-up as to who will get that half million tons of Japanese business. Actually, I think the American lines have the edge *at the moment.* Generally speaking they have more and better ships to throw into the trade, but the race is not always to the swift. Foreigners are building, and the day will come all too soon when your present advantage of tonnage will pass. What then? Survival of your services will depend upon the firmness of the foundations on which they are built. That means good management at home to keep costs down and insure good service to your patrons. It means establishing sound and efficient organizations abroad to insure that your business will be looked after properly on the other end.

You have one other advantage that you might well hold and cultivate. You are in residence here. You are more aware of and more sensitive to the requirements of West Coast shippers than your foreign competitors, and therefore you stand more logically in the position to serve them in transpacific trade.

One of the most important subjects to which you should give your attention, I believe, is that of passenger service in the Pacific. I don't think there is any doubt that American flag ships will provide the bulk of surface transportation, but the proportion of the business that will go to the air lines will govern largely your plans as to number of ships, speed, and types of service.

One other matter of interest to Pacific shipping men is, I am sure, the question of West Coast to Europe trade. That picture, until very recently, did not look quite as bright as the transpacific one. It must be admitted that Pacific Coast trade with Europe has never known strong American flag competition. The present prospects seem to be that the United States will have some fine, fast ships running to the United Kingdom, and just before leaving Washington I was informed that the States Marine Corporation is establishing an American flag service to the Havre-Hamburg range, covering continental European ports to whose markets over half a million tons of Pacific Coast products moved before the war—none, however, in American bottoms. Although the German lines, which carried about 150,000 tons of freight annually before the war, are gone, all of the foreign lines which operated in this trade in prewar days (with the exception of the Germans and the Japs) are coming back. It is therefore gratifying to know that the American flag will make its appearance on this route. I am also advised that both the States Marine Corporation and the American Pacific Steamship Company have established regular liner operations to the Mediterranean using American flag ships, and that is good news.

One thing on which the West Coast is to be congratulated in particular is its energy in establishing American flag service to the Mediterranean. The American Pacific Steamship Company has now established regular liner operations there, and is, I believe, the first American flag line to carry Pacific Coast products to that area. I certainly wish it every success.

Another bright spot on the trade route map of the world for Pacific Coast operators is the business which is developing with South and Central America. Those regions are looking to continued expansion of their agriculture and industry, and in this inter-American trade improved American flag services have already been established, through which a lively exchange of goods and services is being developed.

If Pacific Coast operators, and the Merchant Marine as a whole, are to revitalize the industry and take advantage of the opportunities that are before us now to establish American flag services in their proper status in world trade, we must look immediately to the rehabilitation of our entire maritime industry. At the present time there are less than a dozen ships building under the Maritime Commission's program. Unless a new shipbuilding schedule can be authorized without delay, we stand in grave danger of losing even the nucleus of trained and experienced shipyard personnel still remaining from the peak force of 800,000 who were employed in the 72 yards in which the Commission invested $600,000,000 during the war.

According to Lloyd's Register of Shipping, there was a total of 996 ships, aggregating 3,659,335 gross tons, under construction throughout the world, excepting Germany, Japan and Russia, at the end of 1946. Of this total, 52.7 per cent were being built in Great Britain and Ireland, and only 8.9 per cent in the United States. By the end of the first quarter of 1947, the percentage being built in Great Britain and Ireland had risen to 54.3, while the percentage for the United States had dropped to 5.8.

This is a very significant trend. It indicates quite clearly that foreign flag services are making a determined effort to recapture their prewar supremacy in international trade with new, highly competitive tonnage, while we in the United States are permitting ourselves to slip behind. I hope that the American people as a whole realize what the maintenance of a strong and modern Merchant Marine means to the whole economy of this country. It means employment not only for a large force of seagoing personnel, but also for people in the shipyards on both new construction and repair, and in the countless industries throughout the entire country which contribute materials, equipment and fittings that go into the construction and maintenance of ships.

I hope that shippers, in particular, realize how much adequate American flag services mean to them if only from the economic standpoint. It is perfectly true that they are privileged to patronize foreign flag lines if they wish, but they should bear in mind the fact that foreign lines make space available to them primarily because of the existence of American flag ships which are operating in competition. As the Maritime Commission has emphasized to the President's Advisory Committee on the Merchant Marine, if American shipping competition did not exist, it is questionable whether foreign lines would continue to offer their present standard of service to American shippers, particularly with respect to those of our products which are competitive in international trade. Our shippers should also keep very well in mind the fact that if American flag service is not maintained as a going concern, there will be no bottoms available to them at all in the event of a war involving foreign nations and resulting in the withdrawal of their services.

In view of these considerations, and of the importance of an adequate Merchant Marine for national defense, it should be obvious that this country must maintain its shipping services even in cases where they are not commercially profitable. By that I mean that where private operators cannot maintain services with their own resources, it is incumbent upon the government to supply the deficiency through continued application of the principle of construction and operating subsidy aid as provided by the Merchant Marine Act of 1936. In this connection it should be remembered that government subsidy is an aid not only to the operators, but to labor as well, because the funds appropriated to assist shipbuilding and operation are passed on down through the various channels of manufacturing and employment throughout the entire maritime industry and its allied industries.

I am of the belief that there are undoubtedly other ways, in addition to the direct subsidy plan, in which the maritime industry can be assisted through this crucial period of reconversion and planned expansion. This is a subject which everyone concerned with the welfare of the industry might well place under serious study. For my own part, I have made two concrete suggestions to the appropriate committees of both the Senate and House of Representatives in Washington which are studying the needs of the maritime industry.

One of my suggestions is that Congress authorize the use of funds received from the sale of our war-built ships to foreign purchasers, for the construction of new ships in this country. I believe that is a very sound idea. By the end of the first quarter of this year the Maritime Commission had approved the sale of nearly 1,200 vessels of the war fleet, which it is estimated will return a revenue of approximately one billion dollars to the United States Treasury. Foreign governments and nations have purchased 831 of these ships—mostly the Libertys and other less desirable types, of course—and the portion of the total revenue that they will contribute will be considerable. It is only logical, in my opinion, that the money paid into our Treasury by these foreign purchasers, who are buying our ships to place them in competition with our own lines, should be applied to the construction of new American flag vessels to meet that competition.

My other suggestion is that provision be made to permit shipowners to adopt a schedule of accelerated depreciation of their vessels as a means of assisting them in amortizing their investments. It is my understanding that such methods are provided for by many foreign maritime nations for the purpose of enabling their shipowners to tide themselves over poor periods while taking full advantage of good periods of business.

In this connection I believe that serious study should be given to the problem of tramping under the American flag. I have recently examined a plan proposed by the American Tramp Shipowners Institute for the purchase of war-built vessels by American operators for operation in world-wide tramp bulk cargo trades. While I am not prepared at this time to say whether I am in agreement with this plan, I do find that it sets forth some very interesting ideas for the financing of ship purchases to strengthen the American Merchant Marine in this field. It merits consideration, and perhaps accelerated depreciation, which the report suggests, would be of concrete help in this situation.

In closing this discussion on the present status and the future program for our Merchant Marine, let me leave with you a few thoughts on the national and international aspects of our whole maritime outlook. It is necessary for us to look all the way back to the first World War to understand fully and bring into proper focus the events which have brought the nations of the world to their present situation. That war set in motion a process of realignment of power among nations which developed steadily through the nineteen twenties and thirties and culminated in the gigantic struggle for a final show-

(Please turn to page 114)

Marine Insurance

Our London Letter

By Our United Kingdom Correspondent

UNCONTROLLED MARKET

A Lloyd's broker who recently started business did something more than that. He contributed a long article to a leading London daily newspaper, "The Financial Times," under the heading: "Is Lloyd's Efficient?" As the article was well over a thousand words in length, there is no space in this monthly review to go into all the points raised. This newcomer, from the depth of his three months' experience, would cut the number of brokers and replace individual underwriters by an underwriting committee, so scrapping "overlap and laissez faire" in favour of uniformity and regimentation.

A leading member of Lloyd's, with much more than three months' experience, answers that a free competitive market does something that even an archangel's committee would fail at. It gives effect to all shades of opinion, fixes prices naturally, and adapts itself quickly to every change of demand. He continues:

"In the history of Lloyd's the last 50 years have been the most remarkable of all. We have led the way in almost every new kind of insurance; have brought a very large dollar income to Britain; have made thousands of valuable world-wide connections; and, parenthetically, have shown the world and our own Government the right way to secure the credit of an insurance policy.

"If an underwriting committee had been in control since 1897 it is probable that by now Lloyd's would be extinct. It is certain that we should have no non-marine market, that there would have been no Cuthbert Heath or F. W. Marten; no dollar income; very little foreign business; and a membership of a few hundred at most, with aggregate premiums of perhaps £1,000,000 a year.

"It is a great thing to have belonged to this overlapping, vital, loosely organized competitive, human, adaptable, successful and pre-eminently useful society in which a man—God be thanked—may follow his own judgment and speak his own mind."

Ship Repair Costs Up

Twelve months ago, the Liverpool Steam Ship Owners' Association stated in their annual report that "the level of ship repair costs in the United Kingdom is now alarmingly high and it is still rising; it is acting as a deterrent to the restoration of the liner services on an economic basis." The level of cost was then claimed to be 2½ times that of the average of the three years preceding the war. This statement it is recalled in the Association's latest report, just issued, was challenged as an exaggeration, but the Association stood by it and is satisfied as to its accuracy. The Association is also "satisfied that, in the intervening period, the position has still further deteriorated, and that the cost of repairs is now at least 2¾ times that of the average of the three pre-war years." The Association has no doubt at all that ship repairs are now costing 2¾ times as much as the pre-war average, and sees no sign of any reversal in the upward trend. "This excessive cost," it declares, "is a substantial factor in the general cost of ship operation, and represents a serious handicap to the competitive power of British shipping."

Mine Risk Continues in North Sea

The current cargo war risk schedule has been amended, making the rate for Northern European voyages 5s. per cent instead of 2s. per cent. This amendment is regarded as a vindication of Mr. Carl Christensen's theory that there remain many mines yet to be swept around the coasts of Holland, Denmark and Sweden. The annual report of the Liverpool Underwriters' Association, published early in 1947, included a paragraph to the effect that Danish and Swedish waters were comparatively clear of mines. This was regarded in some quarters as being, perhaps, an over-optimistic view, and almost immediately a mine casualty was reported off the Danish coast—as if to confirm the opinion expressed. Moreover, more recent mine losses have, it would appear, brought the War Risk Rating Committee to reconsider their previous adjustment by which, in February, they had reduced the basic rate for voyages not specifically rated from 2s.6d. per cent to 2s. per cent.

Insurance and High Costs

At this time of year—all within the space of a few short weeks—the majority of the United Kingdom Marine Insurance chairmen give to the stockholders of their Companies an account of the executives' stewardship during the preceding year. Thus, Sir Frederick Pascoe Rutter, well-known Governor and Chairman of the London and Lancashire Insurance Company, Limited, of Liverpool and London, describes the marine insurance situation in his particular group of undertakings as follows:

"It is a relief to me now to comment upon our marine business which as you are aware is written by our two companies, 'The Marine' and the 'Standard Marine'. The results have come up to our best anticipation. After the comparative affluence of War business, one could feasibly assume that the result deprived of that exceptional impetus would show a considerable retrogression. But that has not been the case, partly because through the caution of our Underwriters various provisions made in 1945 were more than sufficient to meet the expected liabilities in 1946. But now we are here in 1947 with a more sombre aspect influenced by the increased cost of repairs, which have been fairly estimated as costing anything from 100% to 150% more than would have been necessitated in 1939."

Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

LONGSHOREMEN AND HARBOR WORKERS COMPENSATION ACT INTERPRETATION.

IN THE PAST I HAVE DEALT with the many problems that confront the average tugboat operator when an employee is injured aboard one of his tugs or barges. Following an injury, he must determine at his peril whether or not the injured employee comes within the provisions of the Longshoremen & Harbor Workers Compensation Act or, on the other hand, is a member of the crew. If he comes within the latter category, he would be restricted to a recovery of maintenance and cure, regardless of negligence, and damages only where negligence is capable of proof.

In *Gallagher's Case,* 1945 A.M.C. 143, the United States Circuit Court of Appeals, Second Circuit, recently decided an interesting case that involved a situation where the plaintiff, an employee of Long Island Railroad Company, was drowned on October 1, 1941, when he fell from the bow of a carfloat that was being docked by the tug Cutchoque at one of the company's terminals in Long Island City. The decedent's heirs made a claim under the Longshoremen & Harbor Worker's Act and the employer defended on the ground that Gallagher was a member of the crew of the tug when he met his death. You will recall that, if one is shown to be a member of the crew, he is not entitled to the protection of the Longshoremen's Act. The Deputy Commissioner, after conducting a hearing, concluded that Gallagher was not the member of a crew of any vessel within the meaning of the Act and he thereafter made a compensation award in favor of Gallagher's heirs. An action was thereafter instituted in the Federal District Court by the employer in an effort to set aside the Deputy Commissioner's award. The sole issue presented, both in the district court and here, is whether the decedent was a "member of a crew of any vessel" within the meaning of the statutory exception.

Briefly summarized, the basic facts were that the decedent had been in the employ of the railroad for about six months, working in various capacities incidental to the transfer of freight in and about the harbor. Occasionally he worked ashore as a bridgeman, some days he was assigned to duty on a tug, and the greater part of the period of his employment he had worked as a float man. About a week before the fatal accident he had been assigned to the tug Cutchoque as first deck hand or mate. As mate he handled the deck-line when undocking, cleaned the brass and the floor of the pilot house, spliced the ropes, and when docking stood on the bow of the float to give signals to the captain of the tug; and at times he steered the tug with the captain present, although he was not permitted by law to steer in the captain's absence.

The Court, using the language from the famous *Norton* case decided by the Supreme Court in 1944, said that navigation is not limited to "putting over a helm" and, therefore, based upon that decision alone, the decedent, in this case Mr. Gallagher, would have been regarded as a member of the tug's crew had he been steadily employed as he was on the day he was drowned. The appellants, decedent's heirs, urged that the character of his employment could not be properly determined unless his work during the entire period of his employment be taken into consideration, and that it was on this basis the Deputy Commissioner reached his conclusion that the decedent was a longshoreman rather than a member of the crew.

The Circuit Court disagreed with the Deputy Commissioner's findings and affirmed the action of the District Court but clearly indicated that an error in the matter of law had been committed by the Deputy Commissioner. The employee's duties *on the day of the accident* are the critical facts which determine his status as a member of the crew. Of course, he might not be considered within that category if he had been called aboard for a single act of service. However, on the days when his employer assigned him to service as mate of the vessel, he was a crew member although he might cease to be one on days he was assigned for other duties. The Court stated:

> "We can preceive no reason in the words or purpose of the Compensation Act for lumping an employee's activities over the period of his employment and classifying him according to the greater number of days on which he was either seaman or longshoreman. As the court said in *South Chicago Coal & Dock Co. vs. assett*, 309 U. S. 251, 260, 1940 A.M.C. 327, the question concerns the employee's 'actual duties.' On the day in question the decedent's duties pertained to the operation and welfare of the tug during her navigation."

The decision in *Gallagher's* case appears to be of first impression in Federal Courts of the United States. It clearly indicates that one must define rights and liabilities by virture of the immediate relationship of the employee and employer as well as the place of employment at the time of the accident rather than considering the overall working schedule of the particular employee concerned.

Admiralty Jurisdiction—Piers; Bridges; Cables

If I suggested to you that a vessel, as a result of negligent operation, struck a pier thereby causing damage, you would probably conclude that the pier owner would be entitled to bring suit for his damage in the Admiralty Division of the Federal Courts because the damage concerned a maritime cause of action. One cannot, however, determine jurisdiction by considering alone the particular physical or moving forces that are involved in the accident, collision or controversy. The point that I am trying to make is well illustrated by the recent case of *City of Perth Amboy vs. N. N. Petterson Lighterage Co. et al*, U.S.D.C., N.J., 1945 A.M.C. 189, where the libelant, a municipal corporation, owned a pier in the State of New Jersey. They instituted an action in the Admiralty Division of the United States District Court. The complaint disclosed that the respondents were in the management and control of the barge GREEN ARROW and the tug NAUTIC. The tug towed the barge to libelant's pier where it was made fast in a careless and imprudent manner, so that with the incoming tide the prow of the barge became engaged in the deck of the pier and, with the further rise of the tide, the barge destroyed and demolished the pier.

The respondents excepted to the jurisdiction of the Court upon the ground that no recovery can be had in Admiralty for damage to the pier as alleged. The District Court in New Jersey held that the exception was well taken. The Court discussed analagous cases, which were briefly described, in order to sustain its decision. In *The Plymouth*, 70 U. S. 20, a United States Supreme Court decision, it was held that damages to a pier by fire, having its origin in a burning vessel moored to the pier, could not be recovered for in Admiralty. In a later Supreme Court decision, *The Blackheath*, 195 U. S. 361, it was held that injury to a beacon made fast to the bed of a river or bay, *being an aid to navigation*, could be recovered for in Admiralty. Later the *Cleveland Terminal* case, 208 U. S. 316, held that there was no jurisdiction in Admiralty to recover for damage to a bridge, nor was any such recovery permitted for damage to a dock or wharf next below such bridge because *they were each so connected with the shore that they immediately concerned commerce upon land.*

One interesting case makes a distinction between a power cable and a cable used in transmitting messages, where it was held that damages to a power cable, unlike damages to a cable used in communications, could not be recovered for in Admiralty because no *aid to navigation* could be spelled out where power cables were involved.

BOOK REVIEW

1947 EDITION OF LLOYD'S REGISTER

The 1947 edition of Lloyd's Register of American Yachts will soon be ready for distribution and the 41st printing of this volume will be the first since its wartime suspension in 1942.

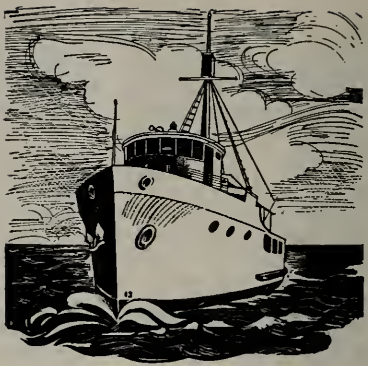
Many of the yachts that entered wartime service have not yet been returned to yachting; others have been converted for commercial purposes. Despite the number that have disappeared from the Register for these reasons, there will be no decrease in the size of this year's fleet, as there will be an addition of over 700 entries of both sail and power craft, including a considerable number of newly constructed yachts from 112′ in length overall downwards. A study of today's fleet, however, would show the growth of the great number of smaller "family" size yachts.

When the 92 yacht clubs listed in the 1903 book are contrasted with the more than 700 entered in the 1947 volume, it can be readily realized that yachting has become a firmly established part of the American scene, and the particulars of club locations, officers, etc., can be helpful and informative to the cruising yachtsmen when entering strange waters.

The Flag Section is once more an attractive feature of the Register, with illustrations of private signals, club burgees, and International Code Signals, in color. Last printed in 1940, the 76 new plates furnish a fresh means of identifying unfamiliar craft.

The new volume, bound in waterproof blue cloth, at $20 per copy, including the Flag Section, can be obtained from Lloyd's Register of Shipping, 17 Battery Place, New York 4, N. Y.

Coast COMMERCIAL CRAFT



STABILITY OF THE TUNA CLIPPER

By DAVID W. DICKIE

PART II

THE PART OF THE STABILITY PROBLEM presented in the first article in the January 1947 issue of the Pacific Marine Review applied to the making of the curves of form and to discussion of the basic difficulties of the stability problem.

It would hardly be prudent to start filling tanks on a strange boat without any warning as to what might happen. An average of all the wood boats measuring up from the bottom of the keel places the center of gravity in the worst condition .88 to .90 of the depth from the bottom to the keel to the top of the deck at the side amidships.

In the case of the steel vessels without an outside box keel, the coefficient for the height of the center of gravity is .82 to .83 of the depth from the top of the keel to the top of the deck at the side amidships.

If the "KG" as found above is deducted from "KM" or the distance of the metacenter above base results in a "GM" of 15 inches or less, extreme care must be exercised not to overturn the boat. Many factors enter into the problem that do not appear on the surface; e. g. most builders smooth the interior of the hull where the frames attach to the keel by filling the interstices with concrete to prevent the boat taking on the odor of trimethylamin from the fish. This item alone varies from 12 to 28 tons and seriously affects the problem of making the inclinations.

It is customary to calculate in advance from the assumed height of the center of gravity what the probable metacentric height (GM) will be for inclinations with fuel and water aboard, when half loaded and when fully loaded. If for any reason a material adverse variation from the advance calculation occurs while making the inclinations, an investigation must be made to account for the error before continuing the work.

About five years ago we began making a record of the period of roll of the tuna boats to see if it would be possible to avoid the laborious process of making some of the calculations. The intention was to use the formula

$(.mB)^2 = GM \times T^2$ where

$.m$ = a factor representing the probable relationship that the Square of the radius of gyration $(K)^2$ bears to the square of the beam of the vessel $(B)^2$

B = the extreme beam of the vessel in feet

GM = the metacentric height in feet

T = the time in seconds for the full roll, over and back taken as an average of 20 rolls.

As the data accumulated it became more and more convincing and (.m) has taken a value between .36 and .40, the small factor applying to the loaded and the large factor to the light condition.

Here again, when the period of roll of the vessel is 8 seconds, there is present the difficulty that the boat will synchronize with the wave period when the vessel lies in the trough of the sea.

At first the natural period of roll of the vessel was observed but after a great deal of research covering the relative merits of various methods, the vessels are rolled artificially by having 4 or 5 men stand on the wharf well away from the ship and pull intermittently on a rope that is attached to the top of the rigging of the mast. The men soon learn to pull in unison with the period of roll of the vessel.

The time in seconds is independent of the number of men or the force of the pull exerted. Due to the fact that the energy required is zero when the angle of roll is zero it is only necessary to be patient to start most any vessel rolling. Two men can roll a vessel weighing 1200 tons quite easily.

In addition to making the calculation using the formula value for the height of the center of gravity of

FIG 3

MOTORSHIP PANAMERICAN

MOVABLE WEIGHTS AND MOMENTS

David W. Dickie

ITEMS			WEIGHT TONS	VERTICAL ABOVE BASE		FORWARD FROM MIDSHIP		AFT FROM MIDSHIP	
				LEVER	MOMENT	LEVER	MOMENT	LEVER	MOMENT
FUEL	FORWARD TANKS	PORT	18.84	17.81	335.54	57.75	1068.01		
		STAR	18.84	17.81	335.54	57.75	1088.01		
	AFTER TANKS	PORT	12.16	17.62	214.26			48.00	583.66
		STAR	12.16	17.62	214.26			48.00	563.68
	AFTER TANKS	PORT	5.43	18.62	101.11			58.75	319.01
		STAR	5.43	18.62	101.11			58.75	319.01
	WELL NUMBER ONE	PORT	18.48	15.71	290.32	19.65	363.13		
		STAR	18.48	15.71	290.32	19.65	363.13		
	WELL NUMBER TWO	PORT	18.18	15.50	281.79	10.78	195.98		
		STAR	18.16	15.50	281.79	10.78	195.98		
	DAY TANK		.66	26.54	18.05	34.50	23.46		
	MIDDLE BAIT BOX		38.61	25.25	979.95			44.00	1707.64
	AFTER BAIT BOX		19.73	25.35	500.15			56.15	1107.84
LUBRICATING OIL	FORWARD	PORT	2.11	26.96	56.86	62.06	130.99		
		STAR	1.03	27.06	27.87	64.37	66.30		
	DAY TANK		.49	17.81	8.73	49.46	24.24		
	SUMP TANK	PORT	.20	13.58	.27	40.10	8.02		
		STAR	.20	13.58	.27	40.10	8.02		
	ICE MACHINE OIL	STAR	1.09	26.77	29.18	59.79	65.17		
FRESH WATER	AFTER TANKS	PORT	8.93	16.71	149.22			40.50	361.66
		STAR	8.93	16.71	149.22			40.50	361.66
SALT WATER	WELL NUMBER 1	PORT	21.80	15.71	342.48	19.65	426.37		
		STAR	21.80	15.71	342.48	19.65	428.37		
	WELL NUMBER 2	PORT	21.45	15.50	332.47	10.78	231.23		
		STAR	21.45	15.50	332.47	10.76	231.23		
	WELL NUMBER 3	PORT	26.88	15.54	417.71	1.28	34.41		
		STAR	26.88	15.54	417.71	1.28	34.41		
	WELL NUMBER 4	PORT	26.27	15.33	402.72			7.89	207.27
		STAR	26.27	15.33	402.72			7.89	207.27
	WELL NUMBER 5	PORT	23.37	15.58	364.10			17.02	397.76
		STAR	23.37	15.58	364.10			17.02	397.76
	WELL NUMBER 6	PORT	19.94	15.93	317.64			25.95	517.44
		STAR	19.94	15.93	317.64			25.95	517.44
	WELL NUMBER 7	PORT	12.77	16.57	211.60			34.00	434.18
		STAR	12.77	16.57	211.60			34.00	434.18
	FORWARD BAIT BOX		53.15	25.15	1336.72			29.95	1591.84
	MIDDLE BAIT BOX		45.79	25.25	1156.20			44.00	2014.76
	AFTER BAIT BOX		23.28	25.35	590.15			56.15	1307.17
	CONDENSER	FOUR	5.90	25.60	151.04			20.90	123.31
	HATCH NUMBER 3	PORT	1.13	21.70	24.52	1.40	1.58		
		STAR	1.13	21.70	24.52	1.40	1.58		
	HATCH NUMBER 4	PORT	1.96	21.50	42.14			8.60	16.85
		STAR	1.96	21.50	42.14			8.60	16.85
	HATCH NUMBER 5	-PORT	1.08	21.40	23.11			17.00	18.36
		STAR	1.08	21.40	23.11			17.00	18.36
	HATCHES ON	FORWARD BAIT BOX	.82	29.18	23.93			29.90	24.52
		MIDDLE BAIT BOX	.82	29.25	23.98			44.20	36.24
		AFTER BAIT BOX	.82	29.38	24.09			57.00	46.74
	BRINE COOLERS	TWO	1.26	26.16	32.96			20.90	26.33
FISH CATCH ON DECK			18.00	22.20	399.60			43.50	783.00
GASOLINE	640 GALLONS		1.84	30.80	56.67			26.90	49.50
SALT			5.00	22.70	113.50			56.10	280.50
AMMONIA			1.00	21.00	21.00			7.00	7.00
CREW			1.50	25.40	38.10			7.50	11.25
STORES			4.50	25.40	114.30	19.60	88.20		
FISH CARGO	LONG TONS 2240 POUNDS		350.10	18.32	6413.83			15.54	5440.55
	SHORT TONS 2000 POUNDS	CANNERY TONS	392.10						

the vessel a rolling test is made before any weights are moved to see what the approximate metacentric height of the vessel is and how far it is prudent to move the weights.

Typical Inclination

A typical inclination procedure will serve to illustrate what is done.

1. A white print of the inboard profile is prepared in advance with the displacement curve, center of flotation curve and tons per inch immersion curve marked on in proper relationship to the midship ordinate.

2. The height of the boat deck rail forward above the calculation base—the height of the top of the guard aft—and a midship point selected for its convenience in relation to the house are taken from the mold loft or preferably from the ship before being launched and marked on the inboard profile.

3. The soundings forward and aft of the vessel are taken to avoid having her too close to the bottom when the tide is low. There should be 4 or 5 feet clear of the bottom of the keel in the worst condition and a person having local knowledge of the tide should be consulted.

4. The specific gravity of the water is taken with a hydrometer. Where an outfall sewer is located near the yard this is especially important after a heavy rain.

5. Some of the builders lay down the lines in the loft along a straight keel and mount the keel in the yard with a sag to take care of the hog of the vessel as she gets older. If in lifting the freeboards—forward—aft—and amidships it is found that the sheer still has a sag in it of say 6″—the displacement is corrected by adding .70 x 6″ x tons per inch immersion at the mean draft at the center of flotation.

6. The welding of the steel vessels begins on the lower structure and finishes with the upper structure. The result is that all the steel vessels have a sag in the sheer of from 5″ to 7″. The amount of sag is found by lifting the freeboards—forward-aft—and amidships. The displacement is corrected by adding .70 x sag x tons per inch immersion at the mean draft at the center of flotation.

7. The simplest arrangement of weights consists of a length of track about 2 feet longer than the beam of the ship fastened to the boat deck. A small railroad car such as is used about the shipyard (about 1500 lbs.) and any convenient weight such as a block of concrete or pieces of metal are used as the inclining weights.

The boat deck should have a shore under it if necessary to support the center of the beams.

8. The amount of movable weights is usually fixed by the weight of the items still to go aboard such as—launch—two skiffs—fishing gear—net—bait receiver—rope—gasoline—boatswains stores, etc.—all of which weighs between 4 and 6 tons depending on the size of the boat.

9. The plumb-bob is of the type having 4 fins vertically to steady it—the length available is usually about 15 feet in the alleyway hatch—and the deflection is usually 5″ approximately. It is hung in a small bucket of water or oil to dampen the surge.

10. The weight is moved
   (1) From the center over to port
   (2) From port past the center over to starboard
   (3) From starboard past the center over to port
   (4) From port past the center over to starboard
   (5) From starboard back to center.

From these movements it is possible to detect if there is free water or oil present and by adding (1) and (5) to the others and taking the mean of the deflections we get the approximate metacentric height right on the job from the formula:

$$\frac{\overset{\text{Weight moved}}{w} \times \overset{\text{Distance moved}}{d} \times \overset{\text{Length of pendulum}}{l}}{\underset{\text{Displacement from curve}}{W} \times \underset{\text{Deflection of pendulum}}{a}} = GM \text{ feet}$$

From the above GM we figure backwards and check the (.m) value and in the calculations the use of Logarithms is advisable. Smoley's tables of the logarithms of feet and inches saves a great deal of work.

11. The boat should be 98 per cent complete before the inclinations are undertaken. There is too much chance for error in estimating the weights to go aboard and this error has never been less tran 11 tons.

12. Reference to the inclination numerical procedure shows that the No. 1 inclination of the steel vessels is made with the—water tanks full—fuel oil deep tanks full—and the condenser full—but the double bottoms empty. This is to make a figure suitable for calculating the return voyage when the fuel is being consumed from the double bottom.

Inclination No. 2 has the double bottoms filled with fuel and lublicating oil.

In San Francisco the oil truck comes down with 7500 gallons of fuel and the only delay is the time required to run it into the ship.

Where these facilities are not available it is necessary to combine inclination No. 1 and No. 2.

Inclination No. 1

Fill: Fuel oil deep tanks forward, port and starboard.
Fuel oil deep tanks aft, port and starboard.
Fresh water tanks, port and starboard.
The condenser running but leave the double bottom empty, port and starboard.

Take the freeboards—forward—aft and amidships measuring down from the datum points described in paragraph 2.

Make a mark on the drawing forward and aft and with a straight edge cross the intersection at the center of flotation curve which is marked on the profile. Read the draft and find the displacement curve. Correct for the sag if any by using the tons per inch immersion curve.

Inclination No. 2

Fill the double bottom No. 1, port and starboard with lubricating oil and double bottoms P&S No. 2, 3 and 4 etc. with fuel oil.

Take the freeboards, incline the boat, take the period of roll over and back for 20 rolls. Fill out the data in the following table in each case.

Draft Forward feet and inches
Aft
Mean at center of flotation
Displacement tons 2240 pounds
Metacentric height GM feet
Period of roll over and back seconds to two decimals
.m value figured from above

Inclination No. 3

Fill No. 3 wells, port and starboard
Take the freeboards, incline the boat
Take the period of roll over and back

Inclination No. 4

Fill No. 1 bait box up into the hatch
Take the freeboards, incline the boat
Take the period of roll over and back

Inclination No. 5

Fill No. 2 bait box up into the hatch
Take the freeboards, incline the boat
Take the period of roll over and back

Inclination No. 6

Fill No. 3 bait box up into the hatch
Take the freeboards, incline the boat
Take the period of roll over and back

Inclination No. 7

Fill No. 4 wells port and starboard
Take the freeboards, incline the boat
Take the period of roll over and back

Inclination No. 8

Fill No. 2 wells, port and starboard
Take the freeboards, incline the boat
Take the period of roll over and back

Inclination No. 9

Fill No. 1 wells, port and starboard
If necessary empty No. 2 wells P&S to bring the boat up out of the water
Take the freeboards, incline the boat
Take the period of roll over and back

Inclination No. 10

Fill No. 5 wells, port and starboard
If necessary empty another well P&S to bring the boat up out of the water
Take the freeboards, incline the boat
Take the period of roll over and back.

The steel boats are encroaching on the danger zone when the bottom of the guard is allowed to get below the water at sea. The legal load line of these vessels is approximately 1 10th of the length in inches below the deck line. With a length over all 130 feet, freeboard of the vessel amidships 13″.

For safe loading of the tuna boats there must be a definite number of wells full of water when the boat has a freeboard of 1 10th of the length in inches. In other words not three ½ wells, port and starboard, but either 3 or 4 wells, port and starboard, must be full. If a well on one side is emptied a corresponding well on the other side must be emptied. The bait boxes and condensers are supposed to be full.

It must be kept in mind that up to this point the only KM or distance of the metacenter above the base available is that obtained from the curves of form made at one particular trim. The variations of KM at other trims will be illustrated in another article together with the effect on the whole problem. This is very important where the metacentric height GM is close to the danger point.

If no adverse error is found for the metacentric height GM for the foregoing inclinations, the vessel can proceed to sea because the approximate GM and change of trim is known for every operation save only putting fish on deck and even this is known because we have the moments for all the bait boxes and usually the after bait box has to be left empty for the first day's catch.

After the inclinations are made they are correlated to get the center of gravity of the whole mass, ship and liquids aboard. Then the weights are deducted and added to get the "Light Ship" condition.

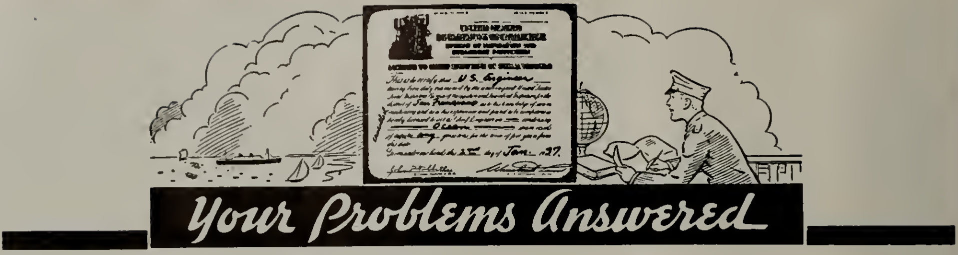
To facilitate making the calculations outlined in the correlation procedure, paragraphs 1 to 6 inclusive, the Table Figure 3 is prepared giving the details of the movable weights and moments. The columns cannot be added because a compartment may be filled with fuel in one instance, salt water in the next and fish in the third and the weights must be known for each condition in its turn.

The columns of weights without the moments is valuable for salvage purposes to determine the floatage and is always included in the final certificate.

1. The first calculation is to add the weight of sea water necessary to fill the bait boxes to see if the vessel will remain upright. Usually she will not have sufficient stability or will be too close to the danger line for safety.

2. The weight of the fuel and water is added to the ship's tanks and the stores, crew, fishing gear, spares etc. are added in the proper places. This would be the same as inclination No. 2 were it not for the fact that when the inclination is made at the shipyard, it is sometimes necessary to fill some of the fuel tanks with water instead of fuel. The oil companies usually only have time to deliver one truck load of fuel. The boat has to go to the fuel dock to have all the tanks filled.

(Please turn to page 118)



by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

PHASE BALANCE RELAY

QUESTION: What is this Phase Balance Relay I hear so much about? I do not think there was one on the electric drive ship I was on several years ago. I have had many Engineers ask me this and have told them that it was just a protective device to sound an alarm when something is wrong. That seems to satisfy them but now I am curious myself about it. So please do not pass me off with a meaningless answer. Remember I am a Marine Engineer and not an electrician, and moreover none of the electricians I have asked can satisfy me. They all seem to know the answer but can not tell me. I know that there is no secret about it but just the same they talk as if it were a secret. So if you do not know the answer just say so and I'll think none the less of you, but so help me, some day I will find out if it's the last thing I do.

A CHIEF ENGINEER.

Dear Chief:

This question has been asked in the Coast Guard License Examinations and because of its puzzling characteristic it has been passed around between engineers a good deal. The examiners have had all kinds of answers but I doubt if they would throw a man out if he failed to answer this one question, with a good score on most all others.

I called up the manufacturers of three different types of equipment. They answered me about as the electricians answered you. I note in Dodd's Marine Electricans Library (McGraw Hill Book Co.) Volume Three, page 296, the following:

"Phase Balance Relay Monitoring Conditions Inside the Main Generator. Normally, the current in the three phases will be exactly the same. If not there is trouble; when the difference exceeds 25 per cent, this relay closes contact and trips off the generator and motor field contactors."

This may be all right but do you now know what a phase balance relay is? I didn't. So I called up a friend of mine who is a little on the theoretical side. He reads up all about the Atom Bomb and such like.

It seems that electrical machines when in some kind of trouble, like overload, burn up with too much current so there is an overload relay in the line and a fuse, or breaker. The overload relay will endure an overload of 10 to 25 per cent for seconds, maybe minutes, before it trips the motor off. This lets the motor ride through short time overloads without losing the load, which is a big advantage. Besides, it permits the high current needed for starting the motor. The fuses or breakers will not be affected until the current is maybe 2 or 3 times normal and when they go out it is *right now*. No time delay wanted. The heavier the overload the quicker they get out.

But—and here comes the point, when the motor is as big as the generator, and the generator is as big as the engine or turbine, then if there is trouble or an overload the turbine slows down, or with synchronous motors we may pull out long before there is enough current to operate an overload relay which will pass full load and starting current without being affected. In other words we cannot overload a motor which is as big as the turbine; at least this is so where there is only one motor on a generator. Nevertheless there are kinds of trouble which must be taken care of, and that is where the phase balance relay comes in. It recognizes trouble even when the load is normal or below.

There are two kinds of internal (inside the machines) trouble. One is a short circuit (failure of insulation) *between conductors* of the coils of the ac winding. The other is grounding (failure of the insulation *between conductor and the frame,* or laminated iron of the winding). With so much power back of it, a short or ground results in a lot of damage, such as melted copper, a big hole in the iron, and maybe a fire in the generator or motor. But, if the power can be cut off quickly enough (and I mean *quickly*) say one tenth to one fiftieth of a second, then the damage is small and perhaps can be repaired even at sea.

It preferably requires two relays to do this—both to trip open the field contactors. This kills the excitation and drops the line voltage to zero. One relay is called the *ground detector* or *ground relay.* I have the dope on this one if anyone is interested. But we are discussing the other relay—the phase balance gadget.

Now, a short between turns or conductors, may not result in a ground, but must be eliminated at once. It may occur in the motor or generator. A short in the armature of a dc generator shows up in sparking. But it is more difficult to detect a short in the armature of the ac generator.

However, such a coil short will unbalance the current in the three phases. Regardless of the load, 10 per cent, half-load, full load, or whatever it is, the current in the three phases is the same. It may be 500 amperes, or 1500 amperes, but if one phase is 1000, another is 1250, and a third is 1100, then there is internal trouble and we must trip off the field at once. The phase balance relay constantly measures this armature current and weighs the value in each of the three phases, balancing each against the other two. If there is a difference of over 25 per cent, it closes its contact and trips the fields.

It's like a three cylinder steam engine. If you have set the valves just right, each cylinder delivers the same horsepower. But if a piston breaks loose from its rod, or an eccentric slips, there will be an unbalance in horsepower. If we had some indicator of some kind constantly watching the hp developed in each cylinder and when they were unbalanced, would trip the throttle, then we would have a cylinder balance relay. Get it? *Cylinders* on the engine, *phases* on the ac generator and motor.

In short, the phase balance relay is a current measuring device which responds when the three currents measured are unequal. It trips the field contactors when it operates.

I hope this settles the question for good.

The Chief.

MODEL MARINE STATION ON NEWPORT BAY

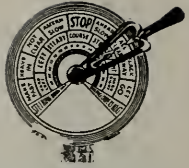
Formal opening of General Petroleum's new model marine station at Balboa, fashionable resort on Newport Bay, California, was held May 17.

The station is directly on the route of vessels in and out of the harbor. In addition to Mobilgas and the Moboil line of lubricants and accessories, the station will stock flying fish for swordfish seekers, frozen foods and ice, soft drinks and other needs of pleasure craft operators.

Latest and most modern mechanical facilities have been provided. Airplane type self-closing fuel nozzles prevent spillage of gasoline and diesel fuel. A mechanical crankcase drain pump not only eliminates the work of hand draining but, more important, avoids spilling oil on the boat. The only marine metering pumps in the harbor will indicate the cost of the gasoline or diesel fuel as it is taken aboard. A floodlighting system will enable the station to conduct fueling operations at night.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE TIDES

(Various deck officer readers of "Steady As You Go" have requested "The Skipper" to do a series of articles on the tides and currents of the world. This is the first of a series of three articles on these subjects.)

History of the Study of the Tides

The tides are a phenomenon of everyday occurrence, like the rising and setting of the sun, but to mankind they have ever been a source of wonder.

One of the earliest known written references to the tides is found in the writings of Herodotus, about 450 B. C. He merely mentions them, offering no explanation.

The next step forward, re the study of the tides we find in the writings of Pytheas, in 325 B. C. In his writings he noticed the fact that there was some mysterious relationship between the tides and the moon, but he was content to stop there without attempting to explain why.

Pliny, in his "Natural History" which appeared in 77 A. D., finally definitely ascribed the action of the tides to the sun and moon. He did not go so far as to explain *why* the tides rose and fell, but he did state that the tide flows twice and ebbs twice between each two risings of the moon. But Pliny, unlike Pytheas, did not know where to stop with his explanations of the moon and tides. He goes on to declare that the action of the tides keeps the ocean clean, with all of the seas being purified every full moon. No animal or man, according to Pliny, ever dies except when the tide is ebbing. Another of Pliny's ancient "scientific truths" that endures to this day is that things grow faster when the moon is full or new, and that the phase of the moon determines the correct time to plant. "The Skipper" sailed with a Bos'un some years ago who must have studied Pliny, for he wouldn't get his hair cut except when the moon was full and the tide was flooding.

From Pliny until the 17th Century no progress was made in explaining the tides. Galileo, Kepler, Varenius, and other philosophers and astronomers all agreed that the moon caused the tides—but no one offered a satisfactory interpretation of why or how. The universal explanation was just that the moon had a "sympathy" for all waters.

In 1687, however, Isaac Newton for the first time gave the connection between the moon and tides a rational explanation with his law of gravitation. "All bodies attract each other with a force directly proportional to their masses, and inversely proportional to the square of the distance between them." This is still the most popular theory, accepted by most scientists today.

Toward the end of the 18th Century, Laplace, a French astronomer and mathematician, approached the problem of the tides from the viewpoint of water in motion. His theory is known as the dynamic theory of the tides, and while it is profound and extremely interesting, his equations and solutions have not been accepted as complete by the majority of present day mathematicians.

Since Isaac Newton and his law of gravitation, some of the outstanding men that have toiled over the problem of the tides are Ferrel and Harris in America; Kelvin, Darwin, Lamb, and Hough in Great Britain; Levy in France; Borgen in Germany; and Van Der Stok in Holland. Their labors and observations, together with the development of self-recording tide gages and other instruments, have succeeded in greatly increasing our knowledge of the tides. A general formula, however, that combines such factors as the time, phase of the moon, latitude, and longitude into an equation that results in the time and height of tide for a given place has yet to be determined. The book of tide tables, familiar to us all, is but a compilation of *predictions*, and although they are extremely accurate they are not the results of precise mathematical formulas.

Tidal Definitions

As a preliminary to a brief explanation of the accepted theory of the tides, a few tidal definitions should be considered:

Tide: The up and down change in the level of the ocean.

High Water: When the tide reaches its highest level.

Low Water: When the tide reaches its lowest level.

Range of the Tide: The difference between high and low water, or vice-versa.

Stand of the Tide: The period at high water or at low water when the level is stationary.

Tidal Current: The horizontal flow of the tidal waters.

Flood Tide: When the water is moving toward the land.

Ebb Tide: When the water is moving away from the land.

Slack Water: When the tidal current has ceased, irrespective of the vertical movement of the water.

Apogee: That point in the moon's orbit farthest from the earth.

Perigee: That point in the moon's orbit nearest the earth.

Quadrature: The condition that is present when the sun and the moon, relative to the earth, are 90° apart.

Conjunction: When the sun and the moon are in a line, both on the same side of the earth.

Opposition: When the sun and the moon are in a line, on opposite sides of the earth.

Neap Tides: Tides with higher low water and lower high water. Neap tides occur when the sun and moon are in quadrature.

Spring Tides: Tides with higher high water and lower low water. Spring tides occur when the sun and moon are in conjunction or opposition.

Rise of Tide: The height of the tide above chart datum.

Synodic Period: The interval between two successive conjunctions of the sun and moon. The synodic period is 29 days, 12 hours, and 44.05 minutes long.

Syzygy Tides: Tides that take place when the sun and moon are on the meridian and in conjunction or opposition.

Priming: Shortening of the 50 minute daily retardation period of the tides.

Lagging: Lengthening of the 50 minute daily retardation period of the tides.

High Water Lunitidal Interval: The period between the moon's transit and the next high tide.

Low Water Lunitidal Interval: The period between the moon's transit and the next low tide.

Vulgar Establishment: An approximation of the establishment of the port, always more than the mean establishment.

Establishment of the Port: The average length of the high water lunitidal interval, varying for each port. (In San Francisco it is about 11 hours and 40 minutes.)

Age of the Tide: The time that has elapsed since the transit that originated the tide and the actual occurrence of the tide. The average for the world is about 1½ days, plus.

Retard of the Tide: Same as the age of the tide.

Superior and Inferior Tides: Tides that occur when the moon is above or below the meridian.

Cause of the Tides

To understand the accepted cause of the tides, we first of all assume that the earth is a non-rotating sphere, entirely covered with water. See Figure 1.)

The attraction of the moon at point "A" pulls the water away from the earth, causing a high tide at point "A". The natural result is low tide at points "B" and "D". Meanwhile the attraction of the moon at the center of the earth, point "E", pulls the earth away from the water

(Please turn to page 116)

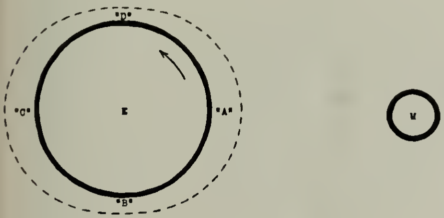


Figure 1.

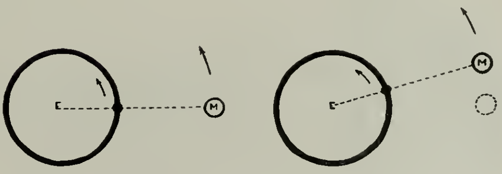


Figure 2.

On the Ways

New Construction - Reconditioning - Repairs

THE HABANA IN TODD'S FOR OVERHAUL

The twin screw Spanish-built, 24 year old, geared turbine liner Habana (ex-Alphonso XIII), put into the Todd Brooklyn yard recently for a rehabilitation job. The pictures on this page show the new accommodations.

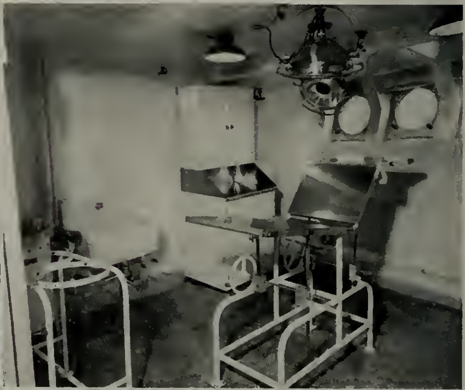
The Habana in the Todd Brooklyn yard after preliminary hull painting. ▶

▼ Lower left: The finished chapel.

▼ At bottom, left: Close-up of cocktail lounge, showing comfortable corner.

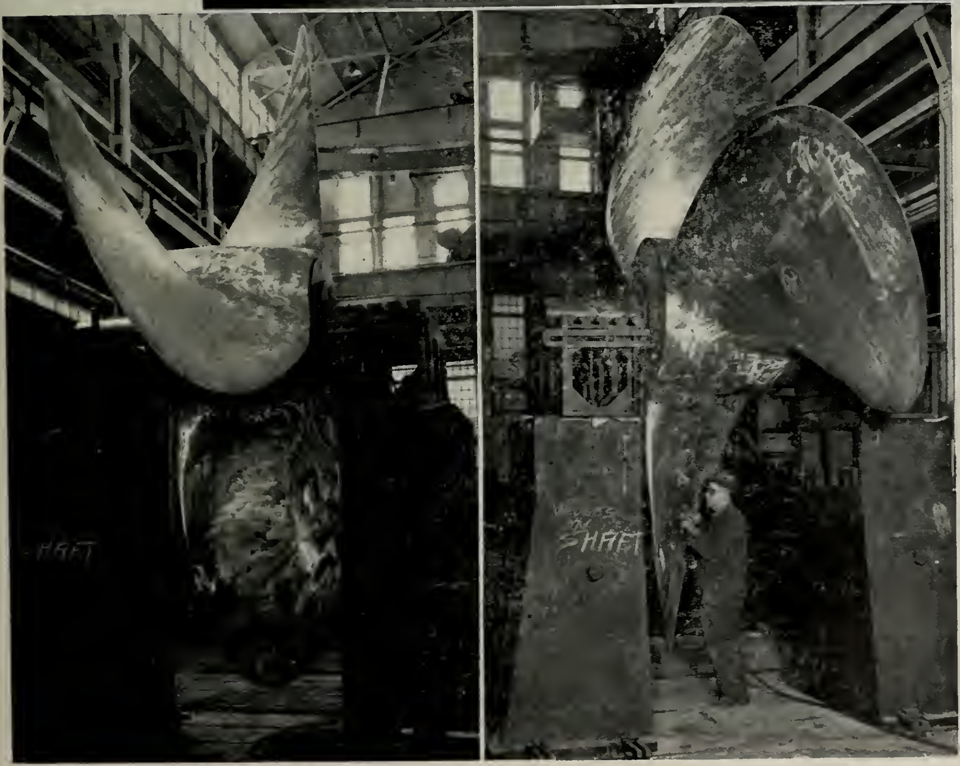
Lower right: Operating room, only a part of new hospital quarters, which include separate wards for men and women. ▶

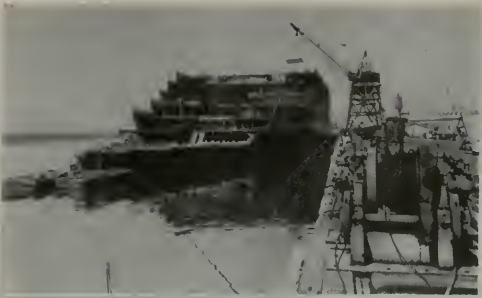
At bottom, right: The new cocktail lounge, taken from stairwell. ▶



The Matsonia In Dry Dock

The Matsonia is shown in dry dock at Bethlehem, San Francisco yard. Below, Matsonia's spare propeller being trued up on the balancing ways.





These pictures show the Normandie being cut up for scrap for next year's automobiles and other essential products.

Photos courtesy of The Linde Air Products Company.

45,000 Tons of Scrap Metal

The luxury liner Normandie is now being cut up into scrap for next year's automobiles and refrigerators. Once the fastest liner on the Atlantic, the Normandie is now a "scrap metal mine" furnishing 200 to 300 tons of badly needed scrap steel every day to American steel mills.

Workers are using oxy-acetylene cutting blowpipes to cut the deck and side plate and partitions into sections that can be loaded into railroad cars.

At the end of each day the loaded cars are shipped to a scrap broker who in turn consigns the metal to the steel mills. The scrapping is being done at Port Newark, New Jersey by Lipsett, Inc.

American Mail's Sea Satyr on the Ways

The above photograph taken at Bethlehem's San Francisco yard, shows a hole 20 feet long by 12 inches wide on the starboard side forward in the bottom of the SS Sea Satyr, C-3 freighter built by Ingalls in 1945, now owned by American Mail Line. Damage was caused by a contact mine as the vessel was backing into anchorage at the Celebes Islands, damaging over 50 per cent of the ship's bottom. Accommodations for 12 passengers will be added.

One Day in Bethlehem's San Francisco Yard

VESSEL	OWNERS—REPRESENTATIVE	FOR ACCOUNT OF	REMARKS
Dredge Holland	U. S. Engineers—Sandstrom	U. S. Govt.	Overhaul
SS Cornell	Pacific Tankers—Elden	U. S. M. C.	Machinery Overhaul
SS Lackawanna	Pacific Tankers—Elden	U. S. M. C.	Complete
SS Sarangan (Ex Webster Victory)	Java Pacific Line—Bosman	Operators	Drydock and Repair and Conversion
SS Sea Satyr	Coastwise—Pac. Far East Voyager (for Amer. Mail)	U. S. M. C.	Drydock and Hull Repair
Dredge Pacific	U. S. Engineers—Miller	U. S. Govt.	Drydock, Voyage and Hull Repair
SS Matsonia	Matson Nav. Co.—White	Owners	Drydock and Voyage Repair
SS Monginevro (Ex Robt. G. Cousins)	General S. S. Co.	Operators	Drydock and Haul Shaft and Miscl. Repair
SS M. E. Lombardi	Std. Oil Co.—Young	Owners	Drydock and Voyage Repair
SS Tradewind	Pac. Far East—Steiner	Operators	Drydock and Voyage Repair
USAT Gen. D. E. Aultman	U. S. Army Trans.—Thearle	U. S. Govt.	Voyage Repairs
SS Marine Adder	A. P. Lines—Jacobson	Operators	Drydock and Voyage Repair
MV Electra			Drydock for Survey
SS Harriet Beecher Stowe	Norton Lilly—Ferguson	U. S. M. C.	Drydock and Voyage Repair
SS J. L. Hanna	Std. Oil Co.—Young	Owners	Drydock and Voyage Repair
MV Don Alberto	Gen S. S. Co.	Operators	Miscl. Repairs
MV Satinleaf MV Abele	Martinolich	Owners	Drydock, Miscl. Repairs
SS Hualalai	Inter-Island Nav. Co.	Owners	Drydock and Miscl. Repair

Running Lights

Edited by B. H. BOYNTON

Above, left to right: Fred A. Hooper was with Williams, Dimond & Co., American-Hawaiian Steamship Co. and a past president of the Propeller Club, Los Angeles-Long Beach Port; William A. St. Amant is district manager of Grace Lines, Inc., Los Angeles, and president of the Los Angeles Steamship Association; J. B. Banning, Jr., assistant freight traffic manager, Matson Navigation Co., in 1946 and vice president and director of the Los Angeles Steamship Association.

LOS ANGELES STEAMSHIP ASSOCIATION—ITS OFFICIALS AND DIRECTORS

Although the successful steamship organization in Los Angeles-Long Beach Harbor, the Los Angeles Steamship Association, first came into existence in the early days of this harbor, which was officially opened for traffic in 1914, the Association is actually only 20 years of age, having been resuscitated in 1927 after several years of inactivity.

When the present Association was organized, in 1927, Fred A. Hooper, district manager, American-Hawaiian Steamship Co., was elected its first president. He served in that capacity for more than two years, until November, 1929, when Ralph J. Chandler, vice president, Matson Navigation Co., succeeded him. Serving with Hooper were Ralph J. Chandler, as vice president and James V. Kennedy as secretary.

The activities of the Los Angeles Steamship Association have largely been confined to traffic matters, favoring policies and practices which would improve the port's position and conditions, nurture and develop traffic, and oppose matters which the Association considered were detrimental or adverse to the best interests of the community.

Some of the activities in which the Association engaged were the organization's support of municipal bond issues proposed for the purpose of further developing the harbor and its facilities; City Charter amendments, as they affect harbor wharfage; equitable rates on cargo, which are charged directly to and borne by shippers; dock construction; railroad service, as it affects the harbor, and many other similar activities which are important to the development of trade, the shipping public and the industry.

Affairs of the Association are conducted by a Board of Directors which meets frequently at the call of the Chair. The current board is composed of the following steamship executives:

President—W. A. St. Amant—W. R. Grace & Co.

Vice President—J. B. Banning, Jr.—Matson Navigation Co.

Secretary-Treasurer—F. A. Hooper.

Directors:

- Edgar M. Wilson—American President Lines, Ltd.;
- C. L. Tilley, Outer Harbor Dock & Wharf Co.;
- E. A. MacMahon—formerly District Manager, Luckenbach Steamship Co.;
- W. B. Bryant—General Steamship Corp., Ltd.;
- M. G. Linder—Transmarine Navigation Co.;
- T. G. Maddox—United States Lines;
- H. R. Dorr—Norton, Lilly & Co.;
- Chas. Bayly—Crescent Wharf & Warehouse Co.

MAY ELECTION

The Los Angeles Steamship Association held a meeting and elected HARRY R. DORR resident manager in Los Angeles for Norton, Lilly & Company, secretary-treasurer to succeed Fred A. Hooper, retired. Elected as new directors of the Association were Stafford S. Harlow, district manager, American-Hawaiian Steamship Company, and Lloyd R. Richards, manager, Sudden & Christenson, Inc.

General meetings of the Association are also held as occasion demands, and these meetings prove to be a common ground where competitors in both domestic and foreign trades meet and discuss mutual problems in an atmosphere of friendship and understanding.

This organization is very proud of its record in that with all the controversial matters that come before them from time to time for consideration, there has never developed a split in its ranks and such differences as may have arisen have always been disposed of amicably

The Association stands to a man in defense of the interests of the Harbor, shippers and the shipping industry.

The Association does not inject itself into labor matters or labor policies as these affairs are well handled by the Waterfront Employers Association of Southern California.

Their main objective is the increase of domestic and foreign waterborne commerce through the ports of Southern California, the improvement of shipping facilities and the establishment of such rates, regulations and fair practices as will bring about that progress to the benefit of shippers and carriers as well as to the taxpayers who own the harbors through which the Association operates.

H. R. Dorr was president Los Angeles Steamship Association, 1943-1944 term; Charles H. Bayly is associated with Crescent Wharf & Warehouse Co., as secretary-treasurer; Max Linder is founder of the Transmarine Navigation Corp.; W. B. Bryant, district manager, General Steamship Corporaton, Ltd.; T. G. Maddox is district manager at Los Angeles for the United States Lines Co. and other Dawson-Sexton interests; Edgar M. Wilson, now vice president American President Lines, Ltd. at Los Angeles; Ernest MacMahon, president of Los Angeles Steamship Association in 1946 and now president of Propeller Club; and Charles L. Tilley, general manager, Outer Harbor Dock & Wharf Co., and vice president and general manager, Outer Harbor Terminal Railway Co.

O. J. Negaard Visits Europe

O. J. Negaard, prominent steamship executive with Java Pacific Line and well known in California shipping circles left May 30 by plane for a six weeks trip to Europe to visit his native country and to make a tour of Europe, including Holland, England, Sweden, Norway, and Denmark.

Negaard's friends report his trip is closely related to world trade and shipping affairs, calculated to aid Pacific Coast shipping in general and San Francisco, as an expanding port, in particular.

Mayor Roger D. Lapham, formerly leading shipping magnate, gave Mr. Negaard an official letter to Europe, as a gesture of goodwill from San Francisco.

New Lines for Costello

President "Joe" Costello of J. M. Costello Supply Co., marine specialties, Los Angeles Harbor, announces that the firm is now representing J & L Steel Corporation's wire rope (Gilmore wire rope division); Oxi Corporation of Gary Indiana; Diamond Power Specialty Corporation of Detroit; Coffin pumps manufactured by the J. S. Coffin, Jr., Company of Englewood, New Jersey; and "Flexitallic" Gasket Co. of Camden, N. J.

In connection with the Costello appointment, Senior Vice President Paul Willis of The J. S. Coffin, Jr., Company, Henry E. Seifried, vice president and L. O. Arringdale, sales manager visited California. "Flexitallic's" vice president S. S. Lippincott also came to California; and President George F. Walters of the Oxi Corporation.

C. M. LeCount Passes

Clarence M. LeCount, consultant to General Electric's Federal & Marine Section of the Industrial Dept. for the Pacific District, passed away May 29 after a short illness.

Born in Henry, S. D., Mr. Le Count graduated from Stanford University in 1911 and immediately joined General Electric in Schenectady, N. Y. Two years later he returned to San Francisco and for 20 years has been well known in west coast marine, naval and shipping circles—being known as "father" of G-E's selling activities to San Francisco Bay Area shipyards during the war years. Affectionately called by all "Dad," his work in the marine field has been outstanding. Among his original jobs was the installation of some of the first double reduction geared turbine units on the Santa boats for the Grace Line. He later was closely identified with such installations as the SS President Hoover's propulsion job and the Bay-Diesel-Electric ferry boat promotion.

C. M. "Dad" LeCount, General Electric Co.

He was a member of the American Institute of Electrical Engineers; Society of Naval Architects and Marine Engineers; the American Society of Naval Engineers; the Mariners Club; the Propeller Club; the Army & Navy Club; and the S. F. Commercial Club.

He resided at 870 Santa Barbara Road in Berkeley and leaves a widow, Julia, and two sons.

NAVY VISITS GENERAL ELECTRIC

Rear Admiral Charles D. Wheelock, USN, (left), assistant chief of the Navy's Bureau of Ships and Rear Admiral Paul F. Lee, USN, (right), chief of the Naval Research Bureau shown during a recent inspection tour of the General Electric Company at Schenectady, N. Y. Dr. J. L. Lawson, (center), of G-E's Research Laboratory explains the operation of a new X-ray spectrum analyzer for gamma rays.

Scenes at the National Marine Exposition in San Francisco. At left: Gathered in the Costello Supply booth are: S. S. Lippincott, vice president of the Flexitallic Gasket Co., W. J. Robbins and Q. A. Herwig from Portland & Seattle offices of International Paint and Joe Costello from Southern California.

Center: Johns-Manville booth. Left to right: H. B. Heyn, T. S. Tulien, Evan Rinehart, A. W. Knight, E. H. Clausen, and H. R. Nelson.

At right: Sperry Gyroscope booth. Left to right: Mr. Horn, W. J. Selover, O. B. Whitaker, marine sales manager, J. F. McConkey, H. S. Burtis and E. A. Williams.

NATIONAL MARINE EXPOSITION

In San Francisco May 12 to 19

◄ Left to right: C. A. Magnell and Charles A. Lindh, superintendent, Pacific Division of Radiomarine Corporation of America.

► At right: William New of George G. Sharp, naval architects, who is Resident in San Francisco for the concern, was one of the judges of the Ship Model Contest. At lower left hand page are other judges of the Ship Models: James S. Hines, publisher of Pacific Marine Review and Rear Admiral Stanley V. Parker, Commandant U.S. Coast Guard, Western Area. Also in the picture is Richard M. Macfarlane, feature writer of the S. F. News, who ably handled the News sponsored Ship Model Contest, and who was the recipient of First Prize in the Propeller Club of the United States news feature contest. ◄

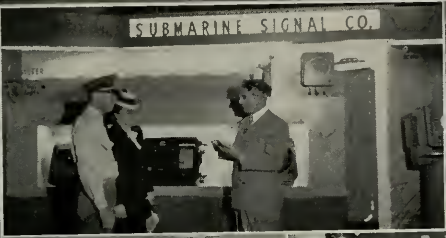
ON OPPOSITE PAGE:
Some of the exhibits and exhibitors of the National Marine Exposition. In the G. E. booth Louis Ets-Hokin poses with the G. E. Electronic Navigator, for which his firm has been named California distributor. Barely discernible to the right are Bob Lane, W. I. Atherton, and Dick Hughes in the Tubbs Cordage booth, and below him is O. D. Colvin of New York explaining to the radio audience how "Cargocaire keeps sweat from ships." Manning the Amercoat exhibit is George Bettinger of Los Angeles. On hand to show the 350 hp Nordberg diesel are P. G. Kollberg and Charles Cox. Out from New York for the show were Vice President E. H. Price and J. V. Brach of Mackay Radio.


BUSS

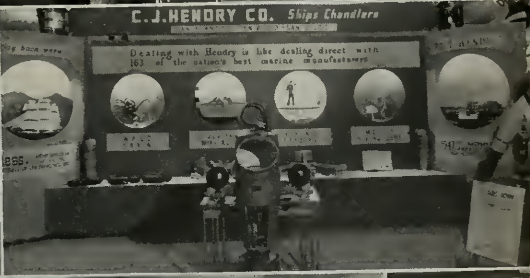

U.S.N.
CARGOCAIRE PROTECTS YOUR GO


NERAL ELEC


TUBBS


SUBMARINE SIGNAL CO.


NORDBERG


C. J. HENDRY CO. Ships Chandlers
Dealing with Hendry is like dealing direct with 163 of the nation's best marine manufacturers


Mackay Rac


YOUR STANDARD MARINE D

MARINE PICTORIAL REVIEW

WINNERS OF TROPHIES AT SAFETY AWARD MEET IN MAY

This meeting was held by the San Francisco Bay Accident Prevention Committee of the Waterfront Employers Association. Offshore, S. F. Bay District, to Jones Stevedoring Company; Coastwise, Terminal Trophy and Bay District Terminal, to Howard Terminal; and Onshore, Bay District and Coastwise to General Stevedoring & Ballast Company.

Left to right: A. W. Young, Fireman's Fund Insurance Co.; P. Holbrook, C. L. Meek, W. L. Mellor and W. E. Jones, Sr., all of Jones Stevedorinig Co.; F. C. Wagener, C. J. Hendry; E. Bigelow, Howard Terminal; S. C. Davis, Accident Prevention Bureau; N. Fillipi, Howard Terminal; G. A. Woods, East Bay Terminal; H. Gerland, Jr., General Stevedore & Ballast, J. H. Travers, Accident Prevention Bureau; and P. Howard of Howard Terminal.

NATIONAL MARINE EXPOSITION BREAKFAST ON NOB HILL
P. G. Kollberg from Milwaukee, Harry Fromm, George Leinhard, and Charles Cox.

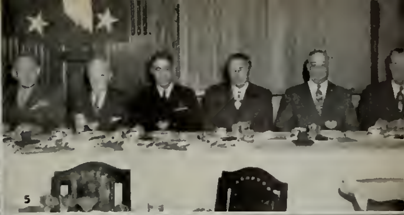
►

W. G. Sheldon, recently made district manager of Luckenbach Steamship Company, headquarters in Los Angeles.

▲ Around the Breakfast table with Tubbs Cordage. Left to right: Dick Hughes, W. I. Atherton, Joe Barry, Bob Lane and Fred Clark with Bob Black at the mike.

(4) Seated: W. Miller Laughton, pres., S. F. Propeller Club; Vice Admiral W. W. Smith, USN (Ret.), chairman, U. S. Maritime Commission, and seated behind the rostrum at the right is J. B. Black, Jr., eloquent luncheon chairman. In the foreground is Captain John E. Murphy who received the Merchant Marine Meritorious Service Medal.

SAN FRANCISCO CELEBRATES MARITIME DAY



(1) Frank Foisie, president, Waterfront Employers Assn.; B. Lenane; Captain Claude B. Mayo, USN (Ret.), Supt. of California Maritime Academy; and Brig. Gen. N. H. McKay, Commanding General, S. F. Port of Embarkation.

(2) Rear Adm. D. B. Beary, Commandant 12th Naval District; A. W. Gatov, vice chairman Maritime Day Committee; Rear Adm. W. K. Scammell, Commandant, USCG, and Lloyd Fleming, Pacific Coast Director, U. S. Maritime Commission.

(3) Facing the camera: John E. Cushing, pres. Marine Exchange; W. P. Brawner, 1st v. p. S. F. Chamber of Commerce; and Major General G. P. Hays, Commanding General, Sixth Army.

(5) Col. C. I. Murray, USMC, Chief of Staff, Dept. of Pacific; Ralph W. Myers, pres., Shipowners Assn. of the Pacific Coast; Captain Malcome Crossman, USMS, Supt. of Officer's School, Alameda; G. S. Perham, pres., S. F. Commercial Club; and Fletcher Monsen, pres., Mariners Club.

(6) Vice Admiral A. E. Montgomery, Commander, 1st Task Force, U. S. Pacific Fleet, and Thos. Coakley, president, State Board of Harbor Commissioners.

(7) Lewis A. Lapham, general chairman, National Maritime Day and new president of American-Hawaiian; E. Russell Lutz, pres. Pacific American Steamship Assn.; and Arthur Foye, pres. Far East-America Council of Commerce and Industry, Inc., with Vice Adm. Montgomery alongside.

At bottom, left: Lewis A. Lapham being interviewed at breakfast on Nob Hill radio program. Center: Admiral Smith signing guest book at the new Merchant Marine lounge in the Ferry Building, sponsored by the Women's Organization for the American Merchant Marine. Behind Admiral Smith is Mrs. James S. Hines and Mrs. Harry W. Parsons, retiring president of the organization. Admiral Smith formally opened this recreational lounge on Maritime Day. At right: During the broadcast Mrs. Hines spoke on the participation of the Women's Organization in maritime activities. Seated in the audience, left to right: W. Eddie Martin; James S. Hines and B. N. DeRochie, publisher and asst. publisher of Pacific Marine Review.

Republic Supply Co. of California, main office, 2122 E. Seventh, Los Angeles.

REPUBLIC SUPPLY CELEBRATES 30th ANNIVERSARY

Only Remaining Independent Oil Well Supply Company Tells Fascinating Story of Progress.

The facts brought out in an interview with The Republic Supply Company of California on the occasion of its recent 30th birthday makes it difficult to write a story without references to Horatio Alger and other exponents of the old "onward and upward" school of fiction . . . which references would quite rightly be resented by the company.

But the facts in themselves are amazing, and would furnish a field day to the statistically-minded boys who love to make charts comparing "then and now". It is probable that no one has prepared figures comparing, let's say, the floor area of the first small Coalinga store and the combined floor areas of the fourteen stores, warehouses, manufacturing plant and offices which Republic Supply occupies today, but those figures would be startling. Further to intrigue the imagination, there is the seeming paradox that the company is still under the direction of the original founders of thirty years ago, yet the management is composed, almost entirely, of men in their early thirties and forties: P. M. Pike, founder of Republic, is chairman of the Board of Directors of the company; Dale Russell, vice president, who managed the first Coalinga store is a member of Republic's Board of Directors; while J. J. Pike, son of the founder, is president of the Company in active charge.

The Republic Supply Company of California has its genesis in the old Tay-Pike Company, which started in 1910, in Coalinga. Our photo shows the store in 1912, with the sidewalk loungers watching a Buick "White Streak" roar past "Whiskey Row" during a road race. In March of 1917, P. M. Pike, who helped found the Tay-Pike Company, formed the Republic Well Supply Company of California, buying Tay-Pike's Coalinga and Taft stores.

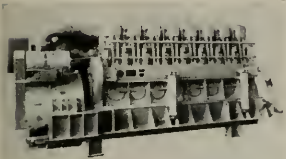
Subsequently, the name of the company was changed to the one it now carries—The Republic Supply Company of California. The main office and store were set up in San Francisco and remained there till 1921, when Los Angeles became the company's headquarters. 1921 also saw the establishment of stores to serve the booming oil fields in Los Angeles, Long Beach, Huntington Beach and Santa Fe Springs, the first oil field supply stores in these areas.

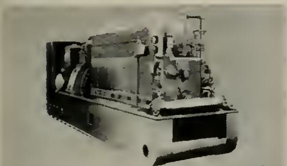
As new discoveries were made and new fields developed, Republic followed the development either with new stores or by buying other companies; for instance the old Associate Supply Company, purchased in its entirety by Republic. Today, Republic boasts supply stores or manufacturing facilities in Los Angeles, Oakland (Emeryville), Avenal, Burrell, Bakersfield, Fresno, Huntington Beach, Long Beach, Newhall Ranch, Santa Maria, Santa Fe Springs, Taft, Ventura and Wilmington.

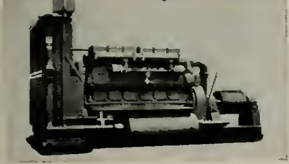
In nearly all cases, Republic owns the properties it occupies, which properties are being expanded and improved as rapidly as conditions allow. The store in Bakersfield for instance, finished in 1937, is regarded as an outstanding example of good modern industrial architecture. A new store has just been built in Fresno, and the finishing touches are being applied to a new structure just completed and now occupied in Wilmington. In addition, it is planned to give the large Los Angeles main office a new and larger home in the course of the next two years, or even earlier if the difficulties of building in these days can be somewhat eased. The manufacturing division, under the guidance of A. G. Fraser, who has been with Republic for twenty years, is outgrowing its present good-sized quarters.

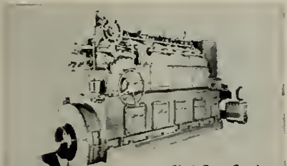
First Republic Store, Coalinga, 1912

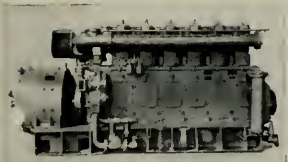
SAFEGUARDING YOUR INVESTMENT!

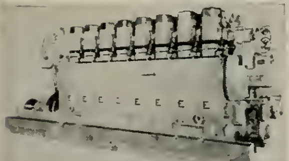

Baldwin Locomotive Works

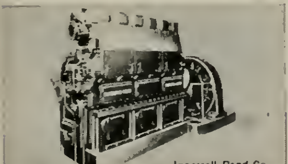

Buckeye Machine Co.

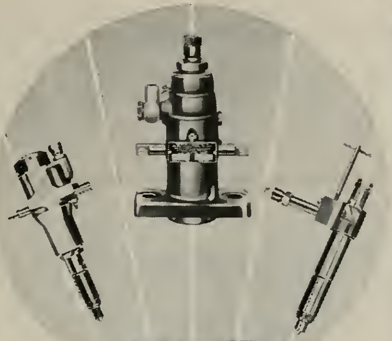
Chicago Pneumatic Tool Co.



Clark Bros. Co., Inc.


Cooper-Bessamer Corp.


Enterprise Engine & Foundry Co.


Ingersoll-Rand Co.



BENDIX SCINTILLA

Leading manufacturers of Diesel engines select Bendix-Scintilla* Fuel Injection Equipment, knowing that a nation-wide service organization stands ready to safeguard the efficiency that makes Bendix-Scintilla their choice. *TRADEMARK

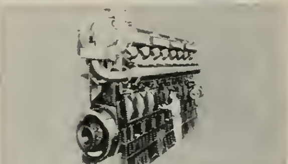
A Nation-Wide Service Organization

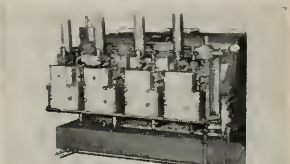
ARIZONA—*Phoenix,* Charlie C. Jones Battery & Electric Co.
CALIFORNIA—*Los Angeles 21,* Magneto Sales & Service Co.
  San Diego, Magneto Sales & Service Co.
  San Francisco 3, H. G. Makelim Magneto Repair Co.
COLORADO—*Denver 3,* Central Supply Co.
ILLINOIS—*Chicago 16,* Illinois Auto Electric Co.
IOWA—*Des Moines 9,* Electrical Service & Sales Co.
LOUISIANA—*New Orleans 13,* John M. Walton, Inc.
MARYLAND—*Baltimore 1,* Parks & Hull Automotive Corp.
MASSACHUSETTS—*Boston 15,* W. J. Connell Co.
MINNESOTA—*Minneapolis 2,* Reinhard Bros. Co., Inc.
MISSOURI—*Kansas City 8,* Electrical & Magneto Service, Inc.
  St. Louis 3, Electric Parts & Service Co.
NEBRASKA—*Omaha 2,* Carl A. Anderson, Inc.
NEW JERSEY—*Newark 2,* Tire Trading Co.
NEW YORK—*Brooklyn 16,* E. A. Wildermuth
  Buffalo 8, Hettrich Electric Service
  New York 23, The Durham Co., Inc.
  Syracuse, The Durham Co., Inc.
OKLAHOMA—*Tulsa 3,* Magneto Ignition Co.
OREGON—*Portland 14,* Automotive Products, Inc.
PENNSYLVANIA—*Philadelphia 32,* J. W. Parkin, Jr.
  Pittsburgh 13, Automotive Ignition Co.
TENNESSEE—*Memphis 4,* Automotive Service Co.
TEXAS—*Houston 1,* Beard & Stone Electric Co.
VIRGINIA—*Richmond,* Chas. H. Woodward Electric Co.
WASHINGTON—*Seattle 14,* Sunset Electric Co.
  Spokane 8, Sunset Electric Co.
WISCONSIN—*Milwaukee 2,* Wisconsin Magneto Co.

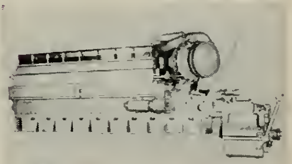
SCINTILLA MAGNETO DIVISION of
Sidney, N.Y.

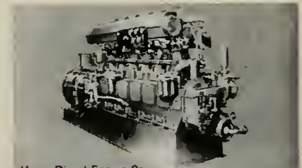
Bendix
AVIATION CORPORATION

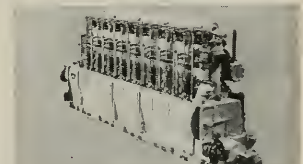

Joshua Hendy Iron Works

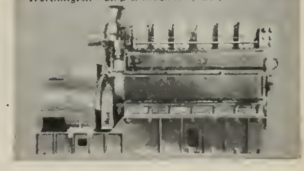

National Supply Co.


Page Engineering Co.


Sterling Engine Co.


Union Diesel Engine Co.


Washington Iron Works

Worthington Pump & Machinery Corp.


NEWS FLASHES

BIDS CALLED FOR ON FIVE V-2000 FOR AMERICAN PRESIDENT LINES

Full-scale restoration of American President Lines' famous Round-the-world passenger-cargo service was assured with announcement that the U.S. Maritime Commission had invited bids for the construction of five de luxe 19 knot passenger ships for use over the company's globe-circling route.

The Maritime Commission set August 13, 1947, as the opening date for bids to build the vessels, with July 14 as the last date for changes.

Known as the V-2000 type and representing the latest in shipbuilding design, the five new vessels will accommodate 189 passengers and replace five passenger-cargo liners taken over from American President Lines by the Navy at the outbreak of the war and not returned. Upon completion, APL will purchase the five new vessels outright from the Commission.

* * * * *

U.S. LINES PLANS TO BUILD 4 SHIPS

Four combination passenger-cargo ships are to be built or purchased, by the U.S. Lines for its New York-London service, it was disclosed in the line's annual report. An agreement with the Maritime Commission provides that the ships will be built provided that the commission allots a satisfactory construction-differential subsidy and that a design is developed which is satisfactory to both the line and the commission. No plans have yet been drawn for the ships and no limits in tonnage and passengers have been set.

* * * * *

U.S. STEEL CORP. READY TO BUILD ON WEST COAST

U.S. Steel Corp. has decided to finance and construct its own pipe-making facilities on the Pacific Coast to maintain its competitive position in that territory should the Justice Dept. succeed in blocking Steel's proposed purchase of Consolidated Steel Corp., Irving S. Olds, chairman of U.S. Steel, disclosed.

* * * * *

GRACE AND LYKES FORM NEW LINE

Lykes Bros. SS Co. and Grace Line have formed a new corporation to be known as the Gulf and South American SS Co., Inc., for the purpose of operating a service between U.S. Gulf ports and ports on the West Coast of South America and to conduct business in South America.

* * * * *

29,000 SHIPLOADS

The Maritime Commission estimates that sea-borne commerce will reach 291,000,000 long tons by 1950, an increase of 19 per cent over the volume of 1937. A great proportion of this will be exported by the United States. The Department of Commerce estimates that during 1947 the United States will furnish about $16,200,000,000 in goods and services to other nations, while they in turn will furnish only about $9,000,000,000 to us. The question for the American people to decide is whether this trade shall be carried in American flag ships or in foreign bottoms.

U.S. ANNOUNCES ELECTRONIC AID POLICY FOR SHIPS

A national policy governing selection and use of electronic aids to marine navigation for American merchant ships was announced by the U.S. at the opening session of the International Meeting on Marine Radio Aids to Navigation. The policy was suggested as a basis for world-wide standardization of radio aids by John S. Cross, assistant chief of the State Dept.'s telecommunications division, who made the announcement.

* * * * *

PAINT FIRM BUILDING NEW $100,000 PLANT

Plans for immediate construction of a $100,000 new factory for the De Boom Paint Company are announced by Claude R. Witzel, manager. The building is to be erected at the corner of Mississippi and 22nd Street, San Francisco, and will have an area of 12,856 square feet of floor space.

* * * * *

FOUR WEST COAST SHIPYARDS TO BE PRESERVED BY MARITIME COMMISSION

The Maritime Commission's plans for its West Coast shipyards as stated by Admiral Smith, include the permanent preservation of four yards, three of which are on San Francisco Bay. The four are Richmond No. 3; Bethlehem-Alameda; Vancouver, Washington; and the West Yard at Oakland.

These yards may be leased by private operators but for ship work only. When a new ship construction gets under way, bidders may base bids on the use of these yards. The Commission itself will not bid against private builders.

* * * * *

WAR LOSSES

"Of the entire prewar U.S. passenger fleet, 52 ships were sunk and only 16 were suitable in 1946 for reconversion for permanent, long range passenger use. With 20 war-built vessels added, we were still 91 vessels short of our prewar passenger fleet as this year opened."--Admiral Smith. (See entire analysis elsewhere in this issue.)

* * * * *

TWO NEW CONSTRUCTION PLANS

Plan No. 1 of the Maritime Commission proposes 65 new passenger-cargo vessels including four express liners or super-liners (Two for Atlantic and two for Pacific.)

Plan No. 2. proposes: 67 new vessels, including six smaller and less expensive passenger liners instead of the super-liners.

These, added to the 36 long range ships in service or under construction January 1, would constitute our passenger fleet.

* * * * *

ALCOA IS EXPANDING FREIGHT OPERATIONS

The freight operations of the Alcoa SS Co. are being expanded to keep pace with an expected increase of U.S. trade with the islands of the Caribbean and countries on the northern coast of South America. Harmon Lewis, president, asserted that his company had applied to the Maritime Commission for the bareboat charter of an additional 16 liberty ships, rising to 78 the number of vessels under Alcoa control.

* * * * *

CURRAN WARNS SEAMEN TO BACK SHIP DISCIPLINE

Joseph Curran, president of the MNU, warned members of his organization that "either they conduct themselves as good union men and perform the work for which they shipped, or they will be cleaned off the ship and out of the union."

11 SUBMARINE JOBS AT HUNTERS POINT

The first of eleven major submarine alteration jobs which will cost a total of about $2,500,000 and require until September 1948 to complete, is underway at the San Francisco Naval Shipyard, Hunters Point.

Two of the 11, the Scabbardfish and the Sea Devil will undergo extensive voyage overhauls as well as the alteration work, at a cost of $300,000 each.

* * * * *

THE "WASHINGTON" RECONVERSION

Limited reconversion to passenger vessel and chartering of the 668-foot North Atlantic liner Washington is announced. Newport News Shipbuilding and Dry Dock Company will do the work at the fixed price of $1,664,885.

* * * * *

SHIP BUILDER CONSERVING FOR BIG PROGRAM AHEAD

Capital of New York Shipbuilding Corp. will be conserved by the management to finance renewed naval and passenger-ship construction, J. F. Metten, chairman of the board, told his annual meeting. More ships are essential if the U.S. is to keep its place as a maritime nation, Metten said. He added that shipbuilding companies must have ample funds to finance the initial stages of building passenger ships.

* * * * *

MARINE RESEARCH GROUP OVERHAULED

The Society of Naval Architects and Marine Engineers took another step toward creation of a central research organization on naval design when it announced an extensive re-organization of its important technical and research committee. The committee will lend its support to the co-ordination of research in the fields of shipbuilding and shipping and will foster research among the facilities available for such purpose.

* * * * *

ATOM-DRIVEN SHIPS NEAR

Ship propulsion by atomic power within five years is predicted by Dr. Karl T. Compton, president of MIT. The saving in ship space by elimination of cumbersome fuel bunkers and in fueling time by substitution of atomic energy power plants promises that ship propulsion will be the first commercial utilization of atomic energy, he said. Dr. Compton suggested that relief from the need of refueling will undoubtedly persuade the Navy to become the first user of atomic energy in ship propulsion. Continuous employment of warships of unlimited cruising radius will revolutionize naval operations, he predicted.

Moore-MacCormack

(Continued from page 46)

order, many of these openings have fallen into disuse during the troopship days of the vessels. The elevators will be placed in good mechanical condition and the load chains renewed. On the Uruguay a complete overhaul of the windlass calls for new 14"x14" steam cylinders, and the repairs on the deck machinery of her sisters will be just as far reaching. New gypsy heads will be installed on the Uruguay's warp winch, and the motors for all electrically operated winches and capstans, including the life boat winches, will be overhauled and cleaned. Overhaul of the steering gear, telemotor, and all allied steering equipment is to be accomplished.

The Uruguay will have sixteen single boats under Welin Quadrant davits when complete. Two of these boats, Nos. 15 and 16 will be newly added. It will be necessary under inspection rules that enough lifeboats will be provided for the vessel's 247 first class passengers, 86 tourist class passengers, and the 407 persons assigned to the crew. New aluminum accommodation ladders of the feathering type will be standard equipment on all ships.

Machinery work will not be anything out of the ordinary. Although the ship's engines have carried her thousands upon thousands of miles, as is the case with so many turbo-electric propulsion units, routine inspection is all that is necessary. All steam piping and auxiliary machinery is being inspected and overhauled as found necessary, and all pumps being checked for corrosion and being renewed where they display excessive wear. A new Worthington submersible bilge pump is being added to the engine rooms which will operate under 50 ft. of submergence for a period of 48 hours. A new sprinkler system is installed throughout the ships, being controlled by an automatic electric fire detecting system. A new and separate sprinkler system pump will handle this added emergency load, and a new ship's air compressor plus an individually operated air compressor to operate the sprinkler system control is being added. These strong safety measures will greatly reduce the fire hazard on the vessels.

Crew quarters have been increased in size and number in many instances, for since the ships were launched the complement has jumped from 350 to 407 persons.

Redecoration of the passenger staterooms and public rooms has been one of the outstanding achievements of the reconversion. Complete rehabilitation of all interiors with new decorative schemes, and smart new colors lend to the beauty of the ships. The new rugs, draperies and upholsteries, exclusively designed for the refitted ships, carry out the gay Latin American theme where richness and life are combined to lend charm to all rooms. The furnishings have been replaced by new, modern pieces, some of which have been designed expressly for the ships. In the staterooms, combination sofa-beds replace the old beds and bunks, giving the rooms the daytime appearance of living rooms which may be used for small social gatherings and lounging when the beds are made up. There are to be comfortable chairs and couches profusely placed about the rooms to complete the illusion of drawing rooms. Commodious chests and wardrobes provide ample stowage space for the passengers' articles. New lighting fixtures provide soft, restful illumination, glare being cut to a minimum.

The safety of the passengers has been one of the prime concerns in the reconversion of these ships, and much of the old woodwork has been ripped out and replaced by walls and ceilings of metal joiner or asbestos, or other non-combustible materials. Many of the new bulkheads are to be finished in a natural wood surface, which, combined with colorful draperys, paintings and upholsteries will create a striking effect.

All public rooms will carry out this same Latin theme, and since the voyages to South America are through warm waters, the passengers will spend a good deal of their time on deck. A lovely verandah cafe has been planned, the windows of which will overlook the swimming pools and will be full length "picture windows." The dining saloons will be completely air conditioned and a sound reproduction system will supply music to all public rooms.

The ventilation systems on the ships will be completely revamped, and all blowers supplying air to old troop compartments will be removed. This will relieve the electrical load considerably, and these blowers can be relocated to benefit crew and passenger accommodations. New air supply fans are being added to the boiler rooms in addition to the natural air supply systems.

Out on deck there will be the swimming pools, deck tennis courts and shuffle-board games, and for the passengers' convenience, a new laundry will be installed forward on B deck, being rebuilt from the former guncrew quarters. There will also be a completely equipped tailor shop, a print shop, photographic dark-rooms, and a post office.

The three ships are also being made ready to handle their share of the cargo, too. They have compartments totaling 450,000 cu. ft. bale for dry cargo in addition to the refrigerated spaces. All masts and booms are being thoroughly checked and reconditioned where wear, corrosion or damaging warrants such work. Standing rigging will be inspected and regalvanized. All running rigging is to be inspected for wear and if it is found in satisfactory condition it will be relubricated and reassembled, and where it is found defective it will be replaced. Blocks, sheaves and pins will be checked and upon completion of the overhaul, all rigging will be tested to see that it is in good working order.

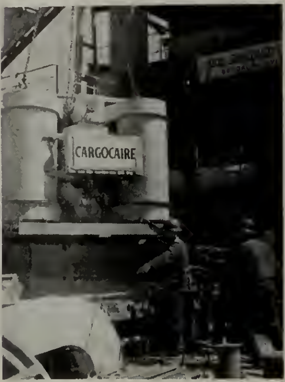
Another new addition to the ships for peacetime operation will be the radar units, developed and used to such great advantage in war, which are now ready for peacetime navigation. And a new coat of paint will lend glamour to these veterans of the seas, for the dull lead-gray of wartime will give way to a green boottopping with the hull painted black above up to the freeboard deck. All houses above A (Main) Deck will be painted a glistening white. All masts, with the exception of topmasts, and booms will be white, and resplendent in these new colors, the "Good Neighbor Fleet" will be ready to put to sea. All bare steel decks for passenger promenade will be covered with a wood decking, neatly caulked and sanded smooth.

The Uruguay is expected to be the first ship completed and she'll sail out of New York harbor on a schedule which calls for a sailing every two weeks when once these three ships are completed. The round trip will be consummated in about 38 days time, and commencing at New York, ports of call will be at Rio de Janeiro and Santos (Port of Sao Paulo) in Brazil, Montevideo in Uruguay, and Buenos Aires, Argentina. There is also a possibility of the ships touching at the Brazilian ports of Recife (Pernambuco) or Bahia (Salvador) enroute to Rio. On the return voyage, the ships will visit the British Isle of Trinidad.

Advance interest indicates that the reconditioned vessels will enjoy a brisk trade as they resume their old routes in South Atlantic waters. There is some hope that eventually one or more of these fine ships will be seen again serving U. S. Pacific Coast ports.

Keep Posted

New Equipment and Literature for Yard, Ship and Dock



The new postwar Cargocaire dehumidifying unit weighing 50 per cent less, occupying only ½ the usual deck space, recently announced to the trade.

Colvin Announces New Carogcaire Unit

A new postwar Cargocaire dehumidifying unit weighing 50 per cent less and occupying only half the usual deck space, was announced by O. D. Colvin, president of the Cargocaire Engineering Corp. Several of these new units have already been delivered aboard vessels now under construction or being reconverted.

New unit showed a reduction of 50 per cent in weight and 50 per cent in actual deck space and the steam consumption was reduced by 6½ per cent while the electrical load was reduced 64 per cent. Another advantage is that the new unit was cycled automatically and was delivered aboard ship in packaged form which eliminated the necessity of any elaborate assembly aboard ship.

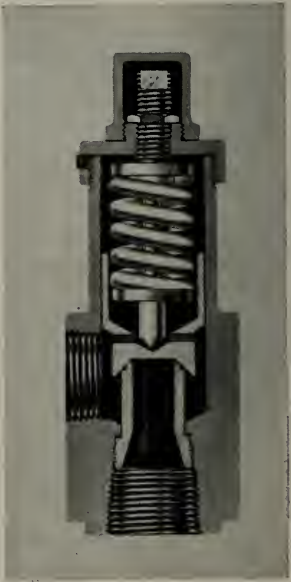
Among the first American lines to receive the new Cargocaire unit, will be the South Atlantic Steamship Line. The first of South Atlantic's vessels to be equipped with the Cargocaire system is the Southport which is now under reconversion at the Brooklyn Division of the Todd Shipyards Corporation. The Brodin Line and the Silver Line, Ltd., are the first of the foreign flag operators to receive this new equipment. the Brodin Line's M/S Lia, the first Scandinavian vessel to be so equipped, is due in New York late in August on her maiden voyage. The Cargocaire system has been specified in the Silver Line's Silverholly and Silveryew which are now under construction in Great Britain.

New Bar-Stock Safety Release Valve

Farris Engineering Corp., Palisades Park, N. J., has introduced a new and simplified relief valve model No. 2745, for pressures up to 10,000 psi. The valve is fabricated completely from bar stock, either bronze, cold rolled steel or stainless steel depending on the service for which it is intended. In either case the disc and nozzle are of stainless steel.

Available with or without test gear, in 3 body sizes—½ in., ¾ in. and 1 in.—interchangeable nozzle inserts provide for proper capacity at set pressures in 3 ranges—2000, 5000 and 10,000 psi for each size. This versatility permits application in a wide variety of services.

Farris Engineering Corp., Palisades Park, N. J., new and simplified relief valve for pressure up to 10,000 psi.



Progress in Bottom Paint Formulation

(Continued from page 69)

corrosive and bare metal primer. One to two hours drying time are required before the application of the anti-fouling which required two to four hours drying time before undocking.

No special equipment is required for application. Either brush or spray may be used. There is no danger of poor performance due to faulty application since both products are fool-proof and may be applied by any docking facility. Applicators are in no way affected by toxic ingredients since only harmless cuprous oxide is used as a toxic.

Both materials are designed to resist hot and cold. They will not run or sag in tropical waters or become embrittled and crack in cold northern waters. They may be applied under any weather conditions although the hull should naturally be dry.

Repainting is not required during interim or emergency drydockings since exposure to the atmosphere for periods of 4 to 8 days has no deleterious effects upon the painting system.

Tremendous dollar savings are realized from the complete elimination of normal losses in speed and normal increases in fuel consumption between drydocking periods.

The acceptance of these coatings by foreign navies and foreign steamship operators is nothing short of amazing. Several foreign navies are using these products, and export shipments are constantly increasing. Such countries, short in credit, definitely cost-conscious, can prove the economy of the increased cost of the plastic coatings, plus the cost freight and plus import duties ranging from a few per cent to 84 per cent.

Perfection in bottom paint formulation is still the aim of all manufacturers. Antifouling coatings of the new plastic type are now considered to be 95 per cent effective as compared to 15 per cent to 25 per cent effectiveness of the obsolete formations. Antifouling coatings fail now only because of a breakdown of the anticorrosive film. When comparable progress is made in anticorrosive paints, a conservative estimate of the life of a bottom paint application will be 3 to 4 years. Today that is the goal of the paint industry.

Captain Curtis Passes

Captain Frank E. Curtis of Pillsbury and Martinolich in San Francisco, passed away during May, after a successful marine career.

His birthplace was in Searsport, Maine, the home of many a seafaring man. Before and during the first war he was with American-Hawaiian, in command of the Oregonian when a sub got her. He was taken prisoner and interned in Spain. In 1923 he joined Pillsbury and Martinolich and last year retired from business.

Those around the Bay Area that sailed with Captain Curtis include Captain N. J. Kane, well-known marine superintendent for American-Hawaiian, and Thomas A, Plant, vice president of that company, who first sailed with Curtis as a super cargo.

Coasting Computer Shows Drift and Distances Off

Distance off beam, distance off on second bearing and angle of drift are easily determined without resort to tables, with the new "Calculaide" coasting computer developed by American Hydromath Co., of New York. With this instrument only the first and second angles and distance run need be known, the computer performing all needed trigonometric calculations.

In the new "Calculaide" coasting computer distance off is given by a circular scale on the base calibrated from 1 to 100. A corresponding distance run scale, from 1 to 10, appears on the rotating slide. Units on these two scales can be miles, nautical miles, yards or feet. First angle curves, carried on the base, show through a window in the slide. Along the edges of this window appear the second angle graduations. Any ordinary two bearing problem can thus be solved in a single setting. Moreover, the computer is so designed that a third bearing can be used to detect and measure cross drift. A useful feature of the instrument is that the distance scales are identical with those on an ordinary slide rule, enabling the device to be used to solve problems involving multiplication, division, percentage, ratio and proportion, etc.


Distance off abeam and distance off second bearing are given by this new "Calculaide" coasting computer. The instrument can also be used as a drift meter and as an ordinary slide rule.

Construction of the new "Calculaide" coasting computer combines precision with durability. It is six inches in diameter, and is made of non-warping "Vinylite" plastic, which is unaffected by oil, perspiration, moisture or salt spray. Scales and graduations are protected by a tough plastic overlay. An attractive genuine leather case is furnished with the instrument. The "Calculaide" coasting computer is priced at $3.50, complete with leather case.

Radical Improvements in Fuel Nozzle Speeds Gas Turbine Development

A fuel nozzle recently perfected by Keith V. Smith of the Westinghouse Research Laboratories in Pittsburgh, Pa., has the unique advantage of giving superior atomization at all fuel rates—even those approaching zero. It performs effectively below the drizzle point of the conventional mechanical atomizing nozzle, and unlike the ordinary nozzle which sprays larger droplets in a hollow cone pattern, it sprays a solid cone of heavy fog.

Developed in connection with gas turbine combustion studies, it will be used on the 2000-horsepower gas turbine generator set now under experimental development at the Westinghouse South Philadelphia Works, which has been designed to run on No. 6 (Bunker "C") fuel oil. The experimental gas turbine is intended for locomotive, marine and utility applications.

Key to the new nozzle's atomizing power is the very small flow of relatively low-pressure compressed air—less than 1 c.f.m.—that enters through six tiny airducts cut at an angle in the nozzle. As these separate streams of air enter the atomizer, their whirling motion sets up a miniature cyclone. This air blast collides with the incoming fuel supply, ripping the heavy oil into droplets so fine that they approach the size of fog particles.

Cut me out and send me in

PRODUCT________________ Page No.________

PACIFIC
MARINE REVIEW

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J. Lester Perry, newly elected president of Columbia Steel Company, West Coast subsidiary of United States Steel Corporation.

J. Lester Perry President Of Columbia Steel

J. Lester Perry, assistant to Benjamin F. Fairless, president of the United States Steel Corporation of Delaware, has been elected President of Columbia Steel Company, U. S. Steel's West Coast subsidiary, succeeding the late William A. Ross, who died in San Francisco on April 19, 1947.

Mr. Perry, who has spent his entire career in the steel industry, began as a cost clerk and rose to the presidency of Carnegie-Illinois Steel Corporation, U. S. Steel's largest steel producing subsidiary. He retired from that post on July 31, 1946, to become assistant to President Fairless.

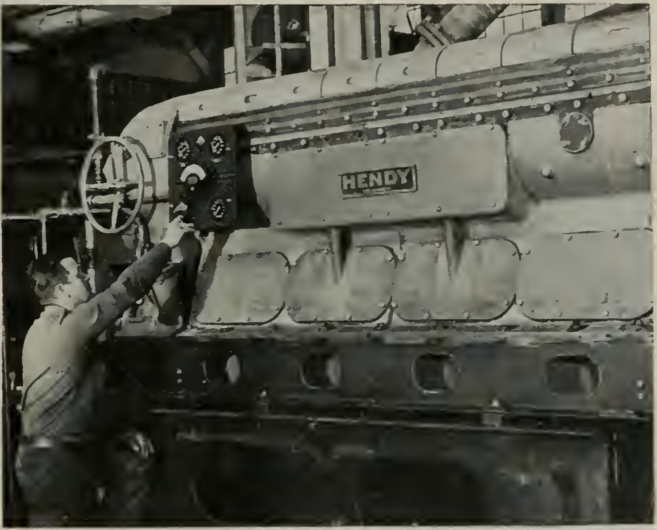
Mr. Perry was scheduled to retire from the steel corporation on May 1, but has agreed to serve as president of Columbia until a permanent successor to Mr. Ross is elected. He arrived in San Francisco on Monday, May 12, to take up his duties. Mr. Perry was a close friend of Mr. Ross during the latter's long association with Columbia.

New Personnel for Gamlen Chemical Company New York Office

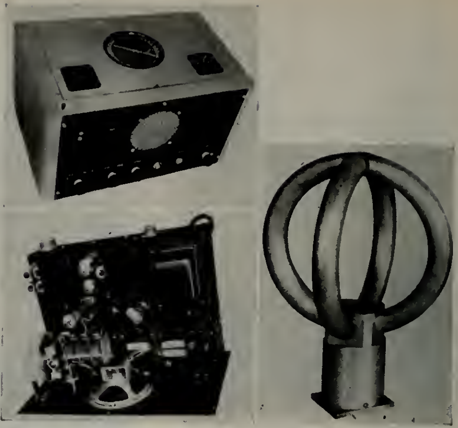
Gamlen Chemical Company, of Pittsburgh and San Francisco, announces the addition of three men to its personnel at the New York district office located at 11 Broadway, which is managed by Tom Faver, Division Director of marine sales for the East and Gulf Coasts.

Val G. Savage has joined Gamlen Chemical Company as marine supervisor in the New York area. Mr. Savage comes to Gamlen with an extensive background of experience in the marine field. Until recently he was associated with Heat Transfer Products as marine superintendent. Previously he occupied positions as operating manager of the East Coast Shipyard at Bayonne, and of the New Jersey Shipyard. During the war he was Head of the Technical Division, Coordinator of Ship Repairs for the U. S. Maritime Commission and the U. S. Navy on the East Coast. Before the war he operated his own business.

William A. Foll and Lee Sikorski have also joined Gamlen Chemical Company as representatives serving the marine industry.



Claude Stewart Heads McNab, Incorporated



McNab, Incorporated has acquired exclusive rights for Automatic Electronic Direction Finder, which was developed by Marine Directional Instrument Company. The pictures show the stationary, hermetically-sealed, cross-looped antenna, which can be located anywhere aboard ship. The case houses all apparatus, including a built-in speaker and provision for head phones. A 2-band, 7-tube, superheterodyne receiver is used to give maximum range. Bearings are said to be obtained instantly, indicating course to a given destination.

McNab, Incorporated, manufacturers of marine instruments since 1909, at a stockholders meeting in February, elected a new president, Claude W. Stewart. The fine reputation which McNab, Incorporated has built up over the years, has been placed in competent hands. Mr. Stewart was born in Jackson County, Oklahoma, March 3, 1908. He is a graduate of Annapolis Naval Academy, having graduated in the year of 1929. He is a retired Commander of the United States Navy, having voluntarily retired after slightly less than 24 years in the Naval Service. He also has had a varied and highly rated operational career in the Naval Air Forces, in addition to his shipboard duties. Both at sea and in the air, Mr. Stewart was directly associated with executive management.

C. W. Stewart, newly elected president of McNab, Incorporated, and formerly Officer-in-Charge of the Naval Air Reserve Program at Floyd Bennett Field. Mr. Stewart has an extensive marine and aviation engineering background.

With Mr. Stewart, Everett R. Johnson was elected as executive vice president. Mr. Johnson is a graduate engineer and has held responsible engineering positions with the United States Government, and is well known in civilian engineering circles. He is, at present, associated with the Kellogg Engineering Company as chief project engineer in the development of jet propulsion.

Since taking over his duties with McNab, Mr. Stewart has acquired exclusive rights for the company to the Automatic Electronic Direction Finder, which was developed and recently advertised by the Marine Directional Instrument Company. The instrument is a major improvement in marine direction finding equipment and was developed by John R. Steinhoff, as a result of his research in radio direction finding since 1934. Mr. Steinhoff has been in the radio field since 1922 and worked on confidential equipment for the United States Navy during the war. The device was exhibited at the Los Angeles Boat Show, from May 30th through June 8th, at the Memorial Coliseum, Los Angeles. Mr. Stewart and Mr. Steinhoff will be on hand to welcome visitors and demonstrate the device at the McNab exhibit. Mr. Stewart made a tour of all principal ports and Canada visiting McNab representatives and made several new appointments.

Frickson of Hagan Corporation To Visit Coast

D. J. Erikson, vice president and general sales manager of Hagan Corporation, Hall Laboratories and Calgon, Inc., will revisit the Pacific Coast this summer, leaving Pittsburgh, Pa., June 20 for six weeks. He will stop at Los Angeles, San Francisco, Portland and Seattle, checking with each branch representative on progress in combustion control and boiler water conditioning. He also will initiate a reorganization of plans to take into account the company's recent purchase of the Ring-Balance Instrument Company of Chicago, which rounds out the Hagan line of controls with a wide line of instruments.

P. E. Paules

Paules Advanced in International Cementers

P. E. Paules, formerly development engineer, and later district manager of the International Cementers, Inc. at Long Beach, has recently been transferred from the General Offices to new responsibilities as District Manager in charge of all of the company's operations in the Oakland-San Francisco area.

Mr. Paules has been identified with the Chemical Service Department of International Cementers, Inc., the organization which provided methods of removing scales and sludges from marine equipment, based on complete analyses for predetermining exact types of scales and prescribing the proper solvent for removing these substances.

He is splendidly qualified both by training and elaborate experience, receiving his B. S. in Chemistry at Loyola University and his M.S. degree at U. S. C.

Paules began his business career with the Americoat Division of American Pipe and Construction at L. A. He taught Chemistry, Mathematics & Physics at Loyola, and later returned to the manufacturing world where he rounded out two years of research work in the Plastics Dept. of Baker Oil Tool Co.

As development engineer for International Cementers, Inc. he has worked directly with marine men in the Long Beach-L. A. harbor district, and now brings this invaluable experience to the Bay area.

Another important change in the I. C. activities is the transfer of H. J. Stock to the General Offices as Development Engineer. Mr. Stock, during the past year has been establishing the company's services in the Oakland-San Francisco area.

H. J. Stock

NEW B & W BULLETIN ON STAINLESS STEEL TUBING: The Babcock & Wilcox Tube Company announces a new bulletin (TB-323) just off the press which outlines some of the many uses of B & W stainless tubing and briefly describes its important properties from an application point of view.

THOMAS E. CUFFE NEW PRESIDENT OF PACIFIC FAR EAST LINES

Thomas E. Cuffe, executive vice president since the company's formation in July, 1946 has been named president. William T. Sexton's resignation was prompted by his desire to devote all of his time and attention to his own shipping company, the Coastwise Pacific Line.

John A. McCone, president of Joshua Hendy Iron Works, has been elected a director in Mr. Sexton's place. John R. Wagner, in charge of traffic, has been named vice president.

All other directors were elected by the Board. They include: S. D. Bechtel, president of W. A. Bechtel Company; Alden G. Roach, president of Consolidated Steel Corp., Los Angeles; Joseph Di Giorgio, president of the Di Giorgio Fruit Corp.; Richard Wagner, and Howard J. Klossner, president and vice president respectively of The Chicago Corporation, leading Middlewest investment trust house, and Thomas E. Cuffe, company president.


Thomas. E. Cuffe, president, Pacific Far East Lines.

The company operates a fleet of 25 dry-cargo and refrigerator vessels between California and the Orient. It has offices at San Francisco, Los Angeles, New York, Chicago and Detroit.

General Machinery Now in 30th Year For Powell Valves


Russell E. Pratt, Sr., president of General Machinery & Supply Company in San Francisco.


Russell A. Pratt, vice president and manager of General Machinery & Supply Company.

It was recently announced by President Russell F. Pratt, who heads up General Machinery & Supply Company in San Francisco, that this firm is now entering its 30th year as Northern California representative for The William Powell Valve Company of Cincinnati. His son, Russell A. Pratt, is now vice president and manager of this firm.

Actual beginning of General Machinery & Supply Company dates back to 1896 when the original name of the company was Compressed Air & General Machinery Company with a territory serviced "from Fresno north to the Oregon Border."

In 1912, when Russell F. Pratt started out, the company became known as General Machinery & Supply Company. His son joined the organization in 1933 and has progressed through all departments.

Marine and industrial heavy hardware supplies, with emphasis on pipe, valves and fittings, is the main line of General's service to all branches of the maritime industry.

Forty-four persons today comprise the staff of the well known house, and the officers are: Russell F. Pratt, president; Russell A. Pratt, vice president and manager; and Arthur R. Clark, secretary-treasurer. The directors are Russell F. Pratt, Russell A. Pratt, Victor L. Schatt, Arthur R. Clark and Kenneth C. Gillis.

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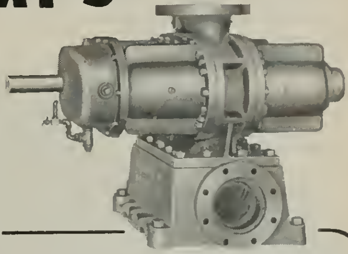
The KINNEY Cargo Pump Model HQAC is compact and ideal for below-deck service. It is specially built for shipboard use and its double helical rotors, driven by enclosed timing gears, develop a continuous, powerful suction that strips tanks clean. The pump will unload through shore lines against a wide range of pressures. Design is compact and rugged, with horizontal suction base and built-in strainer which permits removal of pump working parts without disturbing suction piping. Available in iron, all bronze, or bronze fitted; capacities up to 3000 bbls. per hr.

Write for Bulletin 18A.



KINNEY *Cargo Pump—Model HQAC*

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WE ALSO MANUFACTURE VACUUM PUMPS, CLUTCHES AND BITUMINOUS DISTRIBUTORS.

Admiral Smith

(Continued from page 78)

down in World War II. All through that process the United States adhered to the policy of non-involvement in world political difficulties, and developed a philosophy of isolationism which governed the thinking of our people to an appreciable extent even in the days immediately before we were drawn into the recent war.

The Japanese attack on Pearl Harbor gave us much more than a physical jolt. It suddenly made very clear to us the fact that we could not enforce our isolationism upon other nations which sought to bring us into line with their ideas for a new world order. Even in successfully defending ourselves against the aggressors, we became involved in the very things which it was our desire before the war to avoid.

Even though the Axis nations lost the war, the world-shaking turmoil and devastation they produced served virtually to complete the process of realignment and redistribution of power and influence which started with World War I. From this situation the United States had emerged in the position of unquestioned world leadership. Instead of the nation which a few short years ago sought only to keep and enjoy its own way of life, we are now the international power to which all nations look not only for material assistance in rehabilitating themselves, but also for guidance in rebuilding the economic and political structures of the world.

The experience of World War II and the subsequent events of the postwar period have demonstrated very clearly that no nation as great and as rich as the United States can hope to live more or less unto itself. It appears that if we are to have and enjoy the way of life we cherish, it is going to be necessary for us to extend our influence abroad sufficiently to control the forces which might develop and organize to make another attack upon us and upon other peoples who cherish the things that we cherish. Our experience has taught us that, seemingly, the way to protect these interests is not through a costly defensive war, but through a positive program of action in cooperation with other liberty-loving nations which will prevent the recurrence of a world situation which might result in war.

There are many ways in which the United States can exert a good influence in the field of international relations, but one of the most practical ways is by making its full contribution to the international exchange of goods and services. If we are to make that contribution we must develop and maintain a strong and modern Merchant Marine as a vehicle by which to send our economic power where it is called for by the exigencies of political strategy.

This is where the deepest concern of your Government lies. The Maritime Commission is charged with responsibility for aiding the maritime industry under the Merchant Marine Act of 1936 and subsequent legislation. It is responsible above all, however, to see that this Nation has a Merchant Marine adequate not only to economic needs of the Nation, but also for its defense.

To be perfectly frank, the question of American flag shipping services is no longer a question of commercial enterprise alone. It is a question of national policy of the highest order, in view of the present position of our country in world affairs. That is why the President of the United States appointed an Advisory Committee of leading industrialists and experts to study and report to him on the whole problem of the Merchant Marine. That is why the Congress of the United States, the Maritime Commission, the War and Navy Departments and other agencies of the Government have been hard at work for months on the study of this whole subject.

It is the sincere hope of the Maritime Commission that these studies will soon result in a sound program of long range development of our Merchant Marine on a scale which will insure not only good and adequate American flag service at home and abroad, but also a modern and dependable maritime organization which will be able at any moment's call to place itself again in the front line of defense of our country. This is a hope in which I know all shipping men join as they consider the larger aspects of our maritime outlook.

Let me again express my very best wishes to you Pacific Coast operators in your efforts to re-establish your own services, and my appreciation for the hearty contribution you are making to the Merchant Marine program as a whole. I like the view that West Coast people take of things. It is a fresh, energetic view, marked by the same kind of progressive spirit that sent that first steam-propelled ship across the Atlantic flying the American flag. Good luck to you, and good sailing.

BOOK REVIEW

Dictionary of Foreign Trade

This is a revised and enlarged edition of the Dictionary of Foreign Trade, by Frank Henius, published by Prentice-Hall, New York. Price $12.50.

A unique reference work, it includes up-to-the-minute postwar changes in Foreign Trade terms and practices, and brings together in a single volume a wealth of practical information on every important aspect of Foreign Trade.

Its 6000 principal entries, arranged in alphabetical order, are not limited to the usual brief dictionary-type definitions. Instead, the volume contains specific, detailed, how-to-do-it information on international trade practices and procedures.

Another important feature is its collection of nearly 300 documents used in the trade. The forms reproduced show the latest changes, giving clear, concise explanations of how and when each form is used, as well as how to prepare it.

Another time-saver is the Dictionary's table of foreign trade abbreviations used in English, French, Spanish and German, including commercial, banking, shipping and similar terms, making this compilation the most extensive of its kind ever published.

Steady as You Go

(Continued from page 89)

at point "C", causing high tide at point "C". If our earth were non-rotating, as we have assumed, then at points "A" and "C" we would always have high tides, and at points "B" and "D" always have low tides.

The earth, however, rotates once each 24 hours, and accordingly the length of a tidal day (or lunar day) is slightly more than 24 hours. This is because the moon, in its orbit about the earth, moves so far each day that the earth must revolve for an additional 50 minutes before it is again in the same relative position to the moon. (See Figure 2.)

Assuming any particular point on earth, directly "under" the moon, the interval of time before that point is "under" the moon again is about 24 hours and 50 minutes. Now since our earth *is* rotating, and still assuming it is entirely covered with water, with the moon on the equator we would have two high and two low tides each tidal day, about 6 hours and 12½ minutes apart.

One group of mathematicians, however, claims that the above explanation of Figure 1 is not correct, although the results of their theory are the same. They offer in support of their contention these statements:

(a) High water does not occur when the moon is overhead, but anytime up to twelve hours later.

(b) The moon over point "A" only *reduces* the attraction of the earth at that point to a slight degree, not enough to pull the water away from the earth. The moon could pull the water away from the earth only if the moon's pull were greater, and the pulling force of the moon is but an infinitesimal fraction of the earth's force.

(c) Therefore the water is *not* pulled away at "A" and the earth is *not* pulled away at "C", but the water is pulled *horizontally* away at "B" and "D". This statement is semi-substantiated by their explanation that while it would take a tremendous force to pull the water away from "A", it would not take much force at all, comparatively speaking, to pull the water horizontally away from "B" and "D", because of the great mobility of water.

Whichever school is correct, however, the results are the same. But all of this "pulling" of the water toward the moon happened eons ago, and now the attraction of the moon just serves to keep it constantly "pulled up".

But the attraction of the moon is very definite, and it is measurable. A rough idea of its attracting force can be gained from the statement that when the moon is shining down from directly overhead on the liner S. S. Lurline, she is about 15 lbs. lighter! And if the earth were in slow rotation, completely covered with water, the tide would move around the earth in a long slow wave about 2 feet high, the high water keeping under and opposite the moon.

(But there are other causes for tidal flow, and these will be brought out in the next article on this subject, which will appear in the July Pacific Marine Review. Ed.)

Globe Expands in China

Globe Wireless has opened offices in Tientsin and Peiping, China and will soon open an office in Hankow, China. This announcement was made upon the return of Neil D. Brown, vice president in charge of Globe operations in the Orient, from his headquarters in Shanghai.

"In conjunction with the Chinese Ministry of Communications," said Globe President Stanley Dollar, "Globe Wireless intends to open other offices throughout China. Despite the fact that business in China at the moment is not of the best, we consider the long term viewpoint is favorable and we are laying our expansion plans accordingly."

Neil Brown, in his up-to-the-minute report on conditions in China, told Globe officials that since the war the Chinese Government officials have been mainly occupied with restoring international communications in an effort to build up foreign trade. It has taken so much time to rebuild the international communications that they have had little time to devote to their own domestic communications needs.

Just before he left Shanghai, Mr. Brown was informed by the Ministry of Communications officials that international communications are now almost back on a prewar basis and they are turning their eyes to the domestic picture. This will be a job of rebuilding from the ground up all over China, because all types of local communications were either destroyed or badly damaged by the Japanese.

China is a large country, and Mr. Brown feels that the opportunities for American enterprise, especially those with vision and courage to plan for the future, are tremendous.

Dollaradio, the forerunner of Globe Wireless, was the first American communications company to sign a contract with the Chinese Government, on May 28, 1928. Again in 1941, while war was raging in China, Globe Wireless signed a permanent 15 year contract for international point-to-point service between China and the United States.

Book Review

HOW TO DESIGN SMALL SAILBOATS by E. G. Seibert, Captain, USN, Retired, published by Dodd, Mead and Company, New York. Price $3.00.

Every sailor has cherished the desire to design a boat of his own, and here is a book that will enable the amateur to carry out this most engrossing of nautical feats. The author, a captain in the Navy and an experienced small sailboat designer, contends that technical training is not a prerequisite. Even mathematical talent is not essential, for he believes that a man with "an eye for a boat" can do a good job.

The book tells the process, step by step, in a remarkably clear and concise manner, of the drafting of the working plans for a boat.

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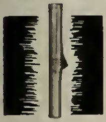
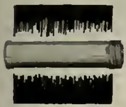

Yacht Signal


Friction Ship Signal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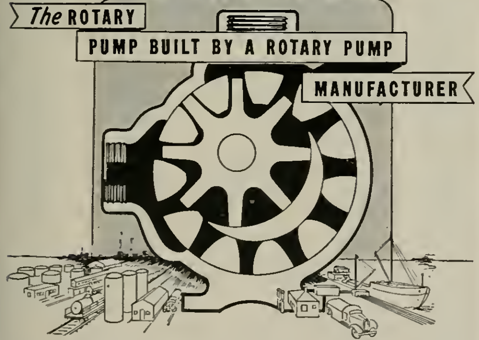

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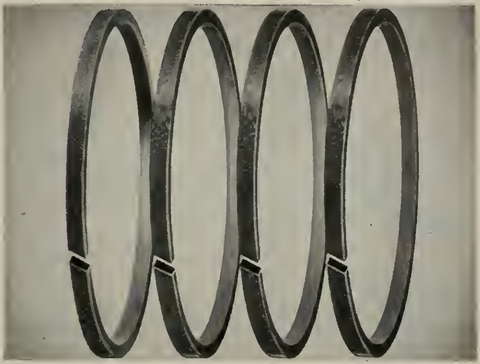
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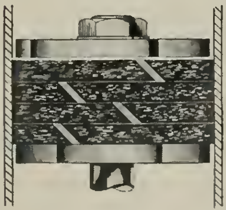

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Stability of Tuna Clippers

(Continued from page 85)

3. The condition of the first catch is calculated and several variations included to eliminate possible trouble. It has been found convenient to lump the details of the fish on deck and water in the hatches into a separate calculation because the water is run "in and out" of the hatches as the fish are being stowed.

4. The condition, loaded going out, is calculated because this is the condition where the vessel is deepest in the water while at sea.

5. The condition, loaded coming home, is calculated as a check and then it is customary to start with Condition 3 above, catching and stowing fish and consuming the fuel and stores in consecutive order until the boat is loaded. In some instances it is necessary to spill half of the water from a bait box while bringing fish on deck to avoid submerging the deck.

6. The condition where the wells are filled with water to thaw the fish upon arrival home has to be checked as on some of the boats, if too many wells are thawed at once the GM is negative.

From the foregoing analysis it will be found that the boats are not all alike in essential stability characteristics. It is customary to select certain dangerous phases and warn the fishermen by posting notices in the pilot house, galley and engine room indicating which parts of the procedure that may have been used elsewhere cannot be used on the particular vessel.

Fish on Deck

There are two general conditions to be contended with in providing for fish on deck:

1. Where the fishing is done on one side aft.
2. Where the fishing is done on both sides aft.

Where the fishing is done on one side, the men are in the fishing racks on the outside of the bulwark on the fishing side and the fish are tossed into the bin on deck between the bait boxes and the bulwark on the fishing side, all of this weight being well off the center of the boat.

Several calculations had to be made to establish just what weight the boat would carry on one side at sea and still have sufficient range of stability to be safe. A simple test to check the calculations was finally devised that settled all doubts. The vessel is placed in fishing trim with the freeboard at the lowest place in inches equal to 1/10th of the overall length of the boat in feet.

A well on one side is pumped carefully until the inclination of the boat brings the top of the guard down to the level of the water. The height of the top of the guard above the water on the high side is measured to get the angle of inclination and the weight of water pumped out is found from the distance the surface of the bait water is down from the deck in the well on the high side. Sixty per cent of the weight of the water pumped from the well on the high side equals the weight of fish that can be put on deck on one side. If this is greater than the amount of fish the bin on deck will hold there is no danger. If the amount of fish the bin on deck will hold is greater it is customary to nail a strip along the bulwark limiting the height of fish in the bin.

Fish in the bin on deck are measured at 41 cubic feet per ton of 2240 pounds.

Where the fishing is done from both sides, the boat has to be watched and water spilled from one of the bait boxes as soon as the top of the guard at the stern begins to approach the level of the sea water overside.

The bottom of the guard at the stern has to be kept out of water in the case of the steel vessels to provide reserve buoyancy. Also the metacentric loss due to free water surface on deck is generally sufficient to produce negative metacentric height and cause the boat to overturn.

No Rime or Reason

(The following poem appeared in "Harmony in G Sharp," published by the staff of Geo. C. Sharp, Naval Architect.)

'Twas a balmy summer evening and all the boys were there
A working at their drafting boards with all due thought and care
It seemed so quiet and tranquil for a little while and then
Bill Scott let out an anguished groan—They've moved the stack again!
Out came the boys' erasers
They scrubbed their tracings clean
And settled down to work again
With faces hard and mean,
Again 'twas quiet and peaceful
Then all the air grew black
When Scott let out another oath—Again they'd moved the stack!
The boys all jumped right up and down
By all the gods they swore
If they didn't leave the stack alone, they'd walk right out the door
But Bill pacified them, then to his board went back
And fainted right upon the floor
Again they'd moved the stack!
They really had an awful job in bringing Bill around
Indeed he looked a sorry sight
Stretched upon the ground
At last he opened wide his eyes
And murmured "Take a vote;
Suggest we leave the stack alone
And move the bl--dy boat."

Alec Thompson

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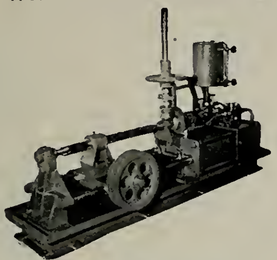

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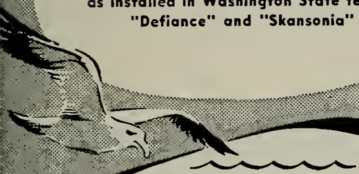

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San Francisco Naval Shipyard

(Continued from page 65)

personnel transports (some two dozen of these after the needs of the "Magic Carpet" were met) and of all types of small auxiliaries were next. Each vessel was laid away, completely in shape from newly-painted hulls and reworked below-deck engines to the cleaning and packaging of ordnance topside.

Today, standby crews totaling nearly a thousand sailors are permanently based at the shipyard to do the continuing work of maintenance, humidity control, and standing security watches over the dozen big ships of the reserve fleet.

Workloads, during the 21 months of peace, have held rather steady, the yard's repair berths and drydocks being taxed constantly. Although work output has slowed as employment ceilings and funds available have dropped, the yard's output per man and quality of work has decidedly increased. Direct proof of yard workmanship is contained in reports from fleet units after their return to sea and in the Fleet's continuing policy of loading the yard with a fair share of available work. Indirectly, yard efficiency and economy of operation are measured in factors by which the work force's morale and willingness to work can be judged. The San Francisco Naval Shipyard has consistently led other such establishments by being the first in work safety records, in payroll savings bond participation, and having higher rate of participation in work improvement training program (including extra studies for high school and junior college credits), in planning and participation in welfare and recreation programs, in low rate of absenteeism and sick leave usage, and beneficial work suggestion leadership which finds the workers contributing on an average of more than 30 time and money-saving ideas per 100 employees each year (the yard saved slightly over a million dollars as the result of these suggestions in three years).

With the completion of its 450 long-ton capacity crane, scheduled for October, with its tremendous ability to hoist entire battleship gun turrets and other large sections of ships and lift them casually to shore, the San Francisco Naval Shipyard may be in for another important job in its new postwar status—that of rebuilding and adapting major fleet units to the changing needs of the future.

Steamship Accounting

(Continued from page 55)

the hull. The factors affecting cargo cubic capacity may be disproportionate to the factors affecting cargo deadweight capacity. With all these factors, who would undertake to estimate in terms of vessel depreciation and insurance, and of cargo revenue lost, what the cost of carrying passengers had been?

Again, a passenger vessel must adhere to a regular schedule of sailing hours and piers. A freight vessel may delay a sailing, shift to another pier in the port, or even make calls at unscheduled ports, in order to get desirable cargo which a passenger vessel must forego. On the other hand, for example, transpacific passenger vessels must make calls at Honolulu, for the pleasure of passengers, but might profitably by-pass Honolulu by as far as 2,000 miles if there were only freight aboard.

Again, passengers load and unload themselves, requiring only a limited stay of the vessel at a pier or dock. Cargo must be received, stored, and loaded, and then unloaded, re-stored, and delivered. The cost of terminal operation are of diverse natures. Who could with reasonable accuracy allocate the cost of terminal operations to passenger traffic and freight traffic? What kind of pier would a steamship company occupy if its operations were entirely passenger or entirely freight, and how does one separate the costs of terminal staff whose services are joint as to passenger and freight traffic?

I leave the discussion of calculating relative passenger and freight net income at this point. Enough has been said to indicate many of the difficulties. I do not say that it is impossible. I hope that any one who may enter the steamship industry will bring a fresh approach to the problem. Perhaps he will yet show us how to arrive at a reasonable approximation of the separate results of carrying passengers and cargo on the same vessel. At the same time he might keep in mind that some of the passenger lines look upon their passenger traffic as an important factor in establishing their prestige and public acceptance, and deem it to have substantial effect on the volume of cargo obtained.

Allocation of Overhead

Frequently it is desirable to attempt an approximation of net profit from a voyage, or at least the profit after allocation of overhead. There is no standard formula for allocating overhead to voyages. The allocation might be made by gross tonnage for passenger vessels, or by deadweight tons for freight vessels. A gross ton is 100 cubic feet of a vessel's enclosed space. A deadweight ton is 2,240 pounds carrying capacity available for cargo, fuel, lubricants, water, or stores. Sometimes overhead is taken as a charge against voyage profits, on the theory that management does, or should, expend efforts in proportion to the voyage profit obtainable. The nature of the accounting problem, not to mention the result desired to be obtained, may influence the method decided upon for overhead allocation.

Conclusion

It is not practicable, in closing, to summarize in a few sentences all that goes before. It might be useful, however, to set down just as a reminder, a few of the high lights of steamship accounting as it differs from accounting likely to be found in another industry.

1. The accounting unit of operations is the terminated voyage. Cost accounting for the terminated voyage is the accountant's paradise or seething hell, depending upon how deeply he likes to get into the most tangled mass of interrelated cost factors which one can imagine.

2. The problem of assembling promptly the voyage revenues, expenses, and physical data related, for example, to a Round-World voyage of about 25 port calls, is enough to keep an accountant on his mettle. The vessel pursers, branch offices, agents at ports "on line" and on the lines of connecting carriers, and the connecting carriers themselves, all together constitute an extraordinarily

(Please turn to page 122)

Steamship Accounting

(Continued from page 120)

large number of sources of the financial data relating to the terminated voyage. These data must be assembled rapidly if the voyage results are to be known with reasonable promptness.

3. Operating-differential subsidy, construction-differential subsidy, recapture of the former and refund of the latter, capital reserve funds, special reserve funds, and construction, reserve funds, all are peculiar to the steamship industry and all require an understanding of the Merchant Marine Act of 1936.

4. Subsidized steamship companies are largely consistent with each other in the terminology, form, and fleet valuations in their financial statements, but nonsubsidized companies, not subject to Maritime Commission General Order 22, are much less consistent with each other.

5. Cabotage is a form of embargo on domestic transportation services which might otherwise be "imported" from vessels of foreign flags.

6. The federal taxation of subsidized steamship companies varies greatly from ordinary federal taxation on corporations.

7. Punched cards are well adapted to the analysis of freight and passenger revenues.

8. The federal statutes, collective bargaining, and established steamship practices combine to make crew payrolls among the most elaborate which are prepared anywhere.

The steamship industry is a service industry, directly dependent for its existence on the volume of trade and travel moving between ports. Because of American high wages, the domestic steamship industry must also depend in part on cabotage for its existence, and the deepsea trades must depend in part on operating-differential subsidy.

Domestically, the seamship industry has trucks and railroads as its principal competitors. On "offshore" trade routes the competitors are airplanes and vessels flying foreign flags.

The size, strength, and soundness of the steamship industry of the United States will, of course, be in part a measure of the wisdom of its management, including those charged with the keeping and interpretation of its accounts. More basically, however, it will be a measure of the long-run need felt by the nation as a whole for the support of domestic and foreign trade by an adequate merchant marine, and for the support by that same merchant marine of military power capable of being exerted beyond our coasts.

Japanese Merchant Fleet

(Continued from page 62)

limits to particular industries were not announced, and possibly were not determined. As this is written, the future limitations on Japan's merchant shipping tonnage are still unknown and no decision has been announced as to whether restrictions in trading areas will be imposed.

It may be assumed, however, that Japan's shipping industry is to be limited in general conformance with the Far Eastern Commission's ruling, but possibly subject to some variations. In the absence of official decision, some speculation may be permitted as to what those limits might be, and the various proposals so far advanced perhaps can then be better compared in that light—indistinct as it may be.

First, we should look back to see what tonnages were employed before the war, and where.

Using the figures supplied by the Japanese themselves, commencing in 1930 we find a total fleet (excluding vessels under 100 gross tons) or about 4,300,000 tons, of which about 2,000,000 were used in local, far Eastern, and South Sea waters. The rest were trading to Europe, South Africa, the Americas, Australia, and India. This total figure gradually declined until, in 1934 and 1935, it was about 4,000,000 tons. The tonnage used in local far Eastern and South Seas trade dropped to about 1,900,000 tons at this time. From 1936 on, the tonnages increased, at first slowly, then rapidly, to a peak at the end of 1941 of 6,300,000 tons. As subsequent developments proved, these increases were largely a matter of planned preparing for an anticipated war. Even at the peak, the tonnage employed in local, far Eastern and South Seas trades was less than 4,000,000 tons until after the war broke out when, of course, the entire tonnage was confined to these areas. The decrease during the war years was sharp, despite a feverish shipbuilding program which produced 4,000,000 tons in four years. At the end, only one and one-half million tons remained, of which a large percentage were war-constructed vessels of very poor quality.

In passing, it is interesting to note the cause of the tremendous war losses of 8,800,000 tons. Japanese records show that more of these vessels were sunk by submarines than by all other causes combined. The Japanese, incidentally, felt that the submarine services of the Allies were never given their proper credit. In the late stages, the air attacks and mining of ports gave the death-blow, but many Japanese felt that much earlier their chances were gone when the submarines cut their supply lines for bringing captured resources to the industrial centers in the Empire and in China.

What conclusions should follow from all of these figures? To allow a merchant fleet of about 4,000,000 tons, as the Japanese seek, would restore them the same fleet they had between 1930 and 1934, as set by the Far Eastern Commission. But during those years Japan was definitely using her merchant fleet as an instrument of foreign policy and was engaging successfully in world trade, with over half of her offshore vessels so employed. Thus it becomes apparent that the total tonnage to be allowed depends on another factor—the trading limits, if any, which are to be imposed. If no limits apply, then the 4,000,000 ton figure can be supported, but if trade is to be restricted to local, Far Eastern and South Seas trades, then the figure would drop to about 2,000,000 tons, since only this tonnage was employed in those areas during the governing period, 1930 to 1934. If trading limits as severe as those recommended in the Pauley Report are to apply, the total tonnage would drop to about the 1,500,000 ton figure there recommended. So


BUILDERS AND REPAIRERS OF SHIPS FOR 42 YEARS
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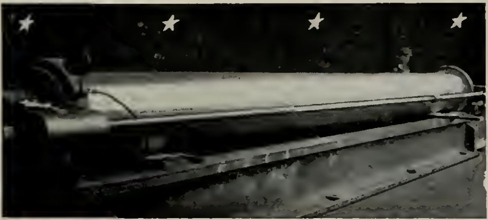


Japanese Merchant Fleet

(Continued from page 122)

it seems that, despite the Far Eastern Commission's decision, we remain uncertain as to future tonnages until we know the trading limits. Decision on the latter point probably will not be reached easily. It involves many complicated economic and political considerations, one of the most controversial of which is the relation between world-wide shipping activities and the ability to wage war.

From the point of view of one who does not pretend to understand any part of the intricate considerations on which economists and statesmen determine what waterborne trade is essential for a nation's survival, there appears very little reason, at this time or in the immediate future, for establishing trading limits which would require a Japanese merchant fleet of 4,000,000 tons. It does seem reasonable that Japan should once again earn the right to be treated as an equal among nations, and should demonstrate her capacity for democratic, peaceful self-government, before she is permitted unlimited foreign expansion of her economy.

At present, the Japanese are making every effort to show as small a total tonnage as possible, to list a maximum number of ships as non-repairable, and to emphasize the limited usefulness and life-expectancy of the remaining war-built vessels. They are also emphasizing the need for repair and building facilities in order to make a case for limiting the number of shipyards to be taken from them as reparations in kind. They constantly urge the need for world-wide merchant shipping activities to support their economy.

Perhaps these representations are being made in good faith and with complete candor, but danger lies in the fact that the American Army and civilian representatives now in Japan do not include any appreciable number of men sufficiently experienced in shipping and foreign trade to evaluate these representations accurately. Decisions of this type involve a multitude of complex factors. They call for the considered judgment of men with years of practical experience in maritime affairs, men of proven executive ability equal to the tremendous task of analyzing and weighing the considerations involved in the control of merchant shipping on a nation-wide basis, men who understand the complexities and interrelation of the waterborne commerce of one nation as it affects that of all other nations trading in the same part of the world.

Apparently the Army authorities in Japan have realized the need for highly specialized advice on these problems, and are endeavoring to obtain experienced American shipping personnel to staff the Water Transportation Division of SCAP's Civil Transportation Section. This presents the American shipping industry with an unparalleled opportunity to contribute materially toward the future stability and prosperity of trade in the Pacific, and perhaps toward future peace in the Pacific as well. It must be earnestly hoped that the response will be equal to the magnitude of the opportunity.

Without attempting more, perhaps a few very generalized conclusions are warranted.

One is that long exposure of an industry to control by a totalitarian state-corporation weakens and threatens to destroy the initiative, efficiency, and productive strength of the industry. Like a creeping disease, it produces an anemia and breakdown of basic structure resulting in paralysis. Recovery is slow; convalescence is long. Hence, the Japanese shipping industry is not ready to, and cannot immediately be permitted to resume uncontrolled private operation.

Another is that the Japanese, looking and planning far ahead—perhaps to the day when they can try again—are making a strong, clever bid to avoid restrictions which would hamper their future efforts to regain a major place in the maritime world. They know that they cannot try again without a great merchant fleet—greater than the one with which they began the last war.

And last, that if Japan should not be allowed to bounce right back as she is trying to do, but should first be firmly established as a peaceful, democratic nation, then the American shipping industry had better start doing something about it—and quickly. The uncertainties still apparent as to how and to what degree Japan is to be limited, give fair warning that unless something is done, our postwar inertia and indifference, for which this country is famous, will cause us to drift into some possibly short-sighted decision without ever having given full consideration to the many complex and long-range factors which can only be properly evaluated by men with great experience in maritime affairs. An ill-considered decision would not only hurt our own shipping industry, but might well prove to be the start of a process which would eventually imperil our national interests in the Pacific. The Army has indicated its desire to obtain the needed expert advice from the American shipping industry. It is not beyond reasonable expectation that, if the industry's advice is withheld, a decision may be reached which would in a very short time cause our ports to be dangerously well-populated with Japanese merchantmen. And maybe, by more than coincidence, many of them will once more be so constructed as to be readily convertible to aircraft carriers and naval auxiliaries.

There seems to be little danger of our being too tough with Japan. It is not in our nature to be so, and history shows quite the contrary to be our habit. There is a real danger of not being tough or alert enough, and of relaxing our vigilance and ending our occupation too soon. Most of us who served there believe that, given the chance, Japan will try again. A powerful merchant marine is an essential element of any such a try by an island empire. They will not repeat the mistake of entering a war with inadequate shipping. If we are to prevent this, the time to do so is now, while longe-range plans are being formulated. If we do not, if the American shipping industry does not make itself heard, we who are in any way connected with it have only ourselves to blame. It would be unrealistic to believe that the day would not come when someone would have to be blamed for what will then have happened.

A Program for Expanding The West's World Trade

(Continued from page 74)

eign oil resources to supply foreign markets and to supplement our own diminishing reserves.

Bethlehem Steel is working in South America for sources of raw materials.

Several of our large food processing companies, such as Calpack, H. J. Heinz Company and others are erecting plants in foreign lands to produce food, not only for foreign lands but also for sources of supply which are short here.

Consolidated Steel Corporation of Los Angeles and Western Pipe & Steel Company of San Francisco are manufacturing great quantities of steel products to be used in foreign installations. Consolidated, alone has orders on its books today of between fifty and one hundred million dollars for fabricated steel products which will be shipped from the Pacific Coast to foreign countries.

Engineering and construction firms of the West are especially active in many parts of the world and many are truly international of scope, such as Morrison-Knudsen Company of San Francisco and Boise, Idaho, which company currently has heavy work in China, India, Afghanistan, Venezuela, Brazil and Canada.

The Utah Construction Company, J. H. Pomeroy Co., and Guy F. Atkinson Company, operating in Pacific areas; Raymond Concrete Pile Company and many others are going to the far parts of the globe with many of their top management men and thousands of competent engineers and mechanics.

These activities which I mention are illustrations of what I term world trade. We export commodities, goods of all kinds, and services, and we bring back to this country other items which are needed here. In these processes of foreign trade we Americans contribute to the well-being of the rest of the world. We find markets for our excesses—we find sources to fulfill our shortages and needs.

In this world trade—two-way world trade—everybody wins and nobody loses.

Guest Speaker Stephen D. Bechtel with Fred B. Galbreath, president of the Foreign Trade Association, and manager of Marine Office of America, San Francisco.

Manila as a Distribution Point

(Continued from page 73)

American apathy. Sufficient to recall that nothing was done.

Today we can look back—look forward—and act—or bask in our self-satisfied and smug superiority complex.

If we adopt a program for the immediate future and distant future, we might with profit to our prognostications recognize how important we made the Philippines to our economy as it relates to the chances of increasing our importing and exporting with the Orient.

Not many years ago Manila was at the very end of the Oriental run for our transpacific ships. That meant that all of the outbound and inbound cargo for that port was penalized—in time and money. Outbound Manila cargo was first in the ship and the last out, and the same inbound. The freight and insurance costs were higher and the time element was costly. It also precluded, to some extent, competitive distribution in the South Asiatic area and thereby failed to encourage the use of the Philippines district as a distributing base. Since Hong Kong, especially, had a time element advantage, plus other advantages, it was more reasonable to distribute from there than from Manila.

We have since learned that we can run our ships direct to Manila from our West Coast and from Panama Canal with good results. We thereby demonstrate that Manila, or some nearby area, can be made our Gateway in the Orient.

The war has completely changed Shanghai. It cannot be expected to regain its former position as the Gateway to China. Very frankly and with all due respect to our Chinese allies, their unfortunate situation as of today cannot encourage us to expect much of Shanghai in the near future.

Hong Kong region may be expected to handle much more of the distribution throughout China, proportionally, from now on. It can also be expected that it will retain a great deal of its former distribution to the neighboring countries to the South but it will have to reckon with Manila in this.

Without discounting the advantages that Hong Kong has, certainly the Manila area has a great deal in her favor and we, as Americans, should expect to take advantage of the possibilities.

After World War I, we tried a "feeder service" for the China Coast and it was abandoned. It did not fail. There is a difference. We made the mistake of believing that if we used Hong Kong as our distribution point we could also depend upon the British and Dutch Coasters to feed to and distribute from our transpacific carriers. The history is sad to relate.

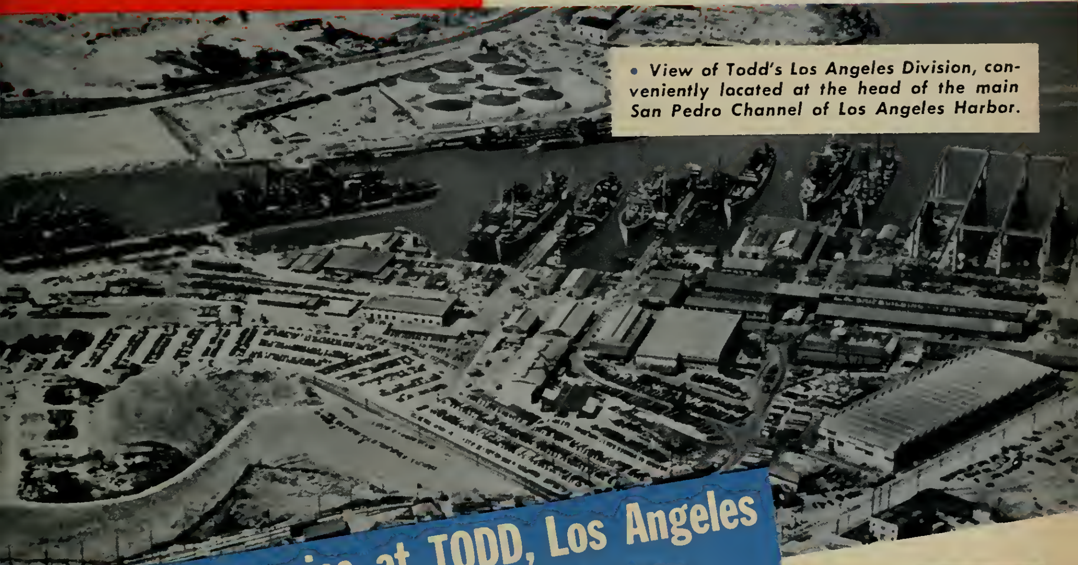
It has been said recently by those who have made studies that we could not possibly maintain a China-India Coast feeder service on account of our high operating costs. That is quite probably true but we certainly should expect that the Filipinos could and would develop a feeder service to cover the China Coast to encompass the Federated Malay States, Java Archipelago and India. It would mean a great deal to their own economy and at the same time develop their own land to our advantage. The idea is of very great mutual importance.

Finally let us give thought to the great developments in aviation. No one can dispute that Manila is our first port of call by air. We now have the very decided advantage of getting personal mail, samples and express freight to Manila quicker than to any other port in the Far East. It may be argued that it will be a long time before we actually handle large tonnages by air but it cannot be disputed that we can now set up our headquarters in the Philippines with more advantage to us that we ever had before.

What are we waiting for?

Pacific MARINE REVIEW

JULY, 1947



• View of Todd's Los Angeles Division, conveniently located at the head of the main San Pedro Channel of Los Angeles Harbor.

eel-to-truck service at TODD, Los Angeles

Anything a vessel needs, from routine overhaul to major repairs, can be obtained, quickly and expertly, at Todd's Los Angeles yard, with its 5 wharves—2 dry docks (of 10,000 and 18,000 ton capacities)—2¾ miles of industrial track—52 buildings housing up-to-date shops, utilities and offices.

OVER whatever sea route a vessel approaches the coasts of the United States, she will find a modernly equipped Todd Shipyard at a nearby port. Wharves, dry docks, shops, materials—all are ready for quick, efficient action. In addition, staffs of marine architects, engineers and other specialists are on hand, prepared to work alone or with an operator's consultants. Whether *your* vessel needs minor repairs or thorough-going "modernization," call on Todd.... *Mobile service is also available at anchor or at dockside.*

•Weld inspection by Gamma-Ray Radiography—modern technique in use at Todd yards—records internal cracks or cavities on film.

TODD SHIPYARDS CORPORATION

LOS ANGELES DIVISION • SEATTLE DIVISION

Conveniently located on Atlantic, Gulf and Pacific Coasts

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MEN and ROP

"Roger" Dequara, cutting coil of
ished rope to proper length, an
ployee of the Tubbs Mills for 24 yea

To win and hold confidence through generations of users means that a product must be uniformly good. Year in and year out, a standard of quality must be set and adhered to. It takes more than mere raw materials and machines to insure a product of such uniform dependability. Behind these must be MEN—men with experience and know-how to build into the product that extra something that results in sustained leadership.

In the mills of the Tubbs Cordage Company old timers—many with a quarter of a century or more of rope making experience—take a pride of craftsmanship in their work. This combination of MEN and ROPE is another of the plus values that makes the name TUBBS stand for quality leadership.

Today, as in pioneer days of the West, you can be sure of rope built to these high standards of excellence by specifying Tubbs Extra Superior Manila to your supplier.

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CORDAGE COMPANY

TUBBS CORDAGE COMPANY

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By T. Douglas MacMullen

Marine Insurance

Coast Commercial Craft

Running Lights By B. H. Boynton

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Red
White
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Pacific
MARINE
REVIEW

FIRST THINGS FIRST!!

SAID GENERAL MacARTHUR in refusing to reprieve a Japanese war criminal in the Philippines, "You have defiled the noble profession of a soldier, whose *first* duty is to protect those within his charge."

To every one of us there is a first duty. It may be an instinctive one, or an acquired one, or one that devolves upon us by virtue of the position we hold or the part we play. To the salesman a good sale is the thing; to the parent, a happy home; to the industrialist, an expanding industry; to a king, the perpetuation of his line; to the national leader, a prosperous country. There are *firsts* for all of us,—perhaps *several* firsts.

The maritime industry has a first duty to which all who participate in it must subscribe—the development and protection of an adequate American Merchant Marine. There are diversified interests in this broad industry who can unite in a common cause. There are strong men in it and successful units in it around whom others may rally and from whom support may be expected. *First* is a strong Merchant Marine. Are we all for it? *If so,* it is within our reach. It must be sufficient, declares the Merchant Marine Act, to carry our domestic waterborne commerce and a substantial part of our overseas commerce *at all times.* It must consist of the best equipped ships of the most suitable type, to be constructed in the United States and manned by Citizens.

At this time, and away out ahead, there is big business available, and there is room for every presently organized shipping company, but unnecessary obstacles are being permitted to obstruct progress.

One of these obstacles is delays. Another is inter-company rivalries. Another is high costs. Another is lack of sufficient public understanding. Another is the changing traffic trends. Another is the rut, caused more or less by all the others, in which the industry finds itself through government ineptitude.

There is an important *first* in the protection of American Shipping from excessive foreign Competition, through the sale of too many ships to noncitizens. Frazer Bailey has taken the lead in protesting this as unjustifiable and contrary to the intent of Congress in the Ship Sales Act, and Albert Gatov points out that this year's sales alone nearly equal the entire American Merchant Fleet in the Pacific. He adds, in behalf of American seamen, that foreign trade now supports two-thirds of all seafaring jobs and we must handle a fair share of our world trade to keep American seamen employed.

The coastwise and intercoastal problems are first. A shipbuilding program is a first. Canal tolls is a first. There are many others. Mr. Bailey is a great and experienced leader. When he calls on the men, the associated organizations, and the companies in the industry to join the fight for one or another of these firsts, he should get a quick and hearty response.

C-3 CONVERSION FOR POPE & TALBOT

POPE & TALBOT, INC., had their beginning in water transportation in San Francisco in 1849, where Andrew Pope and W. A. Talbot were engaged in the lighterage business. Both of them were from East Machias, Maine, and it is interesting to note that in 1849 Captain W. A. Talbot sailed from East Machias, Maine around Cape Horn to San Francisco. In 1853 they brought a prefabricated sawmill from East Machias, Maine, to the West Coast around the Horn and established their first sawmill at Port Gamble on Puget Sound.

They operate three routes: The Pacific Argentine Brazil Line, Pacific Ports to Puerto Rico, (West Indies), and Pacific and Atlantic Intercoastal. Besides this, they act as berth agents for a number of other steamship lines.

The Pacific and Atlantic intercoastal service is operated in accordance with the Fleet Charter arrangements of the United States Maritime Commission. This service operates from Baltimore, Philadelphia, Chester, and Norfolk to Los Angeles, San Francisco, Oakland, Stockton, Portland, Seattle and Tacoma, both east and west bound.

The Pacific Argentine Line operates to and from Vancouver, B. C., Seattle, Portland, San Francisco, Los Angeles, via Panama Canal to the East Coast of South America—to Trinidad, Rio de Janeiro, Santas, Montevideo, and Buenos Aires.

The Pacific West Indies Puerto Rico route operates from Tacoma, Seattle, Portland, San Francisco, Oakland, Los Angeles, to San Juan, Ponce, and Mayaguez, Puerto Rico, via Canal Zone.

Pope & Talbot maintain offices and terminals in Seattle, Tacoma, Portland, San Francisco, Oakland, Stockton, Los Angeles, San Juan (Puerto Rico), Norfolk, Baltimore, Philadelphia, New York, Pittsburgh and Detroit, with foreign agency offices in Vancouver, B. C., Canal Zone, Colombia, Trinidad, Brazil, Uruguay, and Argentina.

The following are the officers of the company:

George A. Pope, Jr., president of the company, is the third generation of the Pope family to head the company since its establishment on the Pacific Coast in 1849.

Fred C. Talbot, first vice president.

Charles L. Wheeler, executive vice president, has been with the company since 1917.

E. N. W. Hunter, assistant to the president and also Acting General Manager of the Steamship Division.

W. Kenneth Pope, vice president and southwest manager with offices at Los Angeles.

Hillman Lueddemann, vice president and northwest manager, with offices in Portland, joined the company in 1921.

G. A. Dundon, vice president and Atlantic coast manager, joined the company in 1922.

E. H. Harms, operating manager, joined the company in 1925.

R. F. Burley, freight traffic manager, joined the company in 1921.

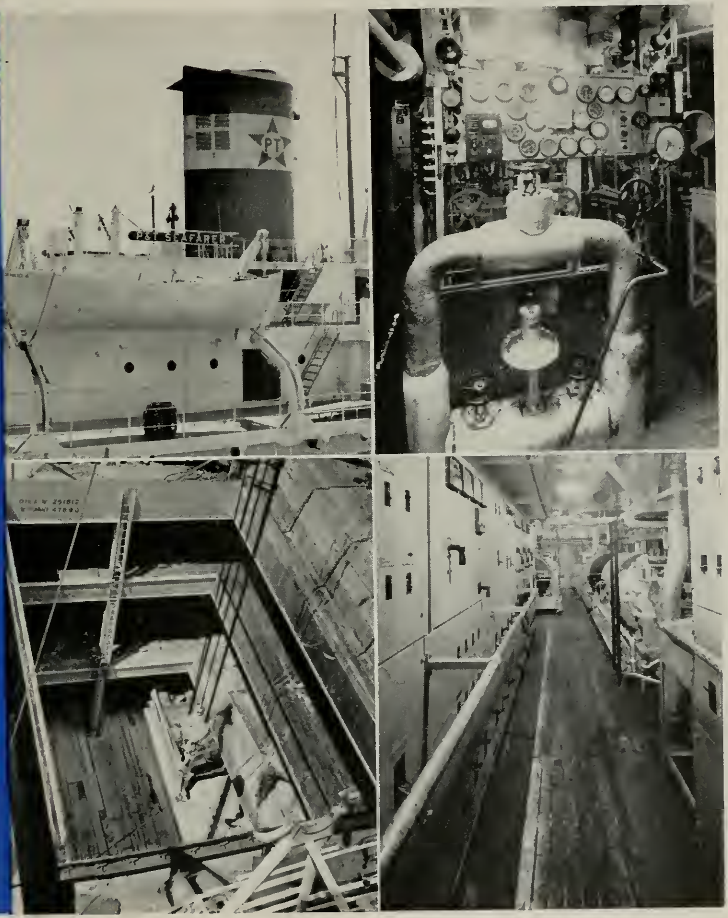
John Clerico, port engineer, joined the company in 1923.

The New Fleet

In re-establishing the fleet for postwar service, Pope & Talbot have purchased six C-3's and renamed them as follows:

P & T Seafarer
P & T Forester
P & T Trader
P & T Pathfinder
P & T Explorer
P & T Navigator

Conversion to Pope & Talbot needs is going ahead rapidly and several of the vessels are already in service. The work on the first four in the above list was assigned to Newport News, the *Explorer* to Todd's Brooklyn Division, and the *Navigator* to Bethlehem at East Boston.



VIEWS ON A TYPICAL POPE & TALBOT C-3

Upper deck featuring lifeboats and stack.

Control stand in the engine room

Hatchway into the capacious cargo holds

Alleyway along dead front switchboard that controls the many electric light and power circuits

At left: Captain G. A. Petterson, skipper of Pope & Talbot Lines newly converted C-3 express cargo ship, the P & T Seafarer, inspects the newly installed General Electric electronic navigator. This modern version of radar will provide greater operating safety by eliminating low visibility shipping hazards. Operating over the Pacific-Argentine-Brazil route, Captain Petterson expects to save valuable time through the use of the G. E. radar.

At right: John Clerico, port engineer for Pope & Talbot. He joined the company in 1923 as chief engineer and has been port engineer since 1935.

CHARACTERISTICS OF THE C-3-S-A2 are as follows:

Length	492′
Breadth Molded	69′ 6″
Draft Loaded	29′ 5″
Gross Tonnage	8010
Deadweight Tonnage	12,805
Engine (Turbine)	8500 hp
Shaft hp	8500
Speed Knots	17
Crew	49
(Permitted total including passengers—66)	
Passengers	12
Dry Cargo Space	678,770 cu. ft.
Liquid Cargo Space	489,490 gal. or 55,840 cu. ft.
Total	734,610 cu. ft.
Fuel Oil	10,672 bbls.

For Pope & Talbot the yards will install a doubler of 20 lb. plate, 24 inches wide on the sheer strake port and starboard, from frames 46½ to frames 149½; the doubler to be welded on edges and butts and quilt riveted in accord with plan submitted by the yard and approved by the American Bureau of Shipping.

The load line markings are to be relocated to conform to additional draft allowed after a load line survey following this strengthening, which additional draft amounts to 10 inches and permits the addition of 600 tons to the deadweight.

The original equipment on these vessels has for the most part, stood the test of heavy wartime service and will not be replaced unless damaged. One of the ships, the P & T *Navigator* (wartime name *Guilford*) shows the following nameplate data.

Deck Equipment

Capstan gears and heads, as well as steering gear and

P & T SEAFARER

anchor windlass were furnished by McKierman-Terry Corp.; the winches by Vulcan Iron Works and Lake Shore Engineering Co.; and the motors, brakes, control panels, resistor boxes, switches and master switches by General Electric and Westinghouse Electric Corporation.

The steering stands and wheels came from the Edison Corp. sounding machine from the A. Lietz Co., the binnacle from K. & W. O. White Co., magnetic compasses from the Lionel Corp., and the master compass, repeaters, switch panel and motor generator sets from Arma Corp. All of the ships have Sperry gyropilot equipment, while the wind recorders, rudder angle indicators, shaft revolution indicators and electric engine room telegraph are by the Friez Instrument division of Bendix Aviation.

There are four Powell Stockless anchor units made by Atlantic Steel Casting Co., and 300 fathoms of National Malleable & Steel Casting Co's. 2½" Stud link chain. Walter Kidde Company's Fire Alarm system is on all of the vessels. With the 30 foot Welin gravity type davits there are Welin winches and Westinghouse motors.

The *Seafarer,* first of the ships to be equipped with radar, has the General Electric Electronic Navigator, and a report on a trial run with this instrument will appear later in this article. The installation was made by Ets-Hokin & Galvan of San Francisco.

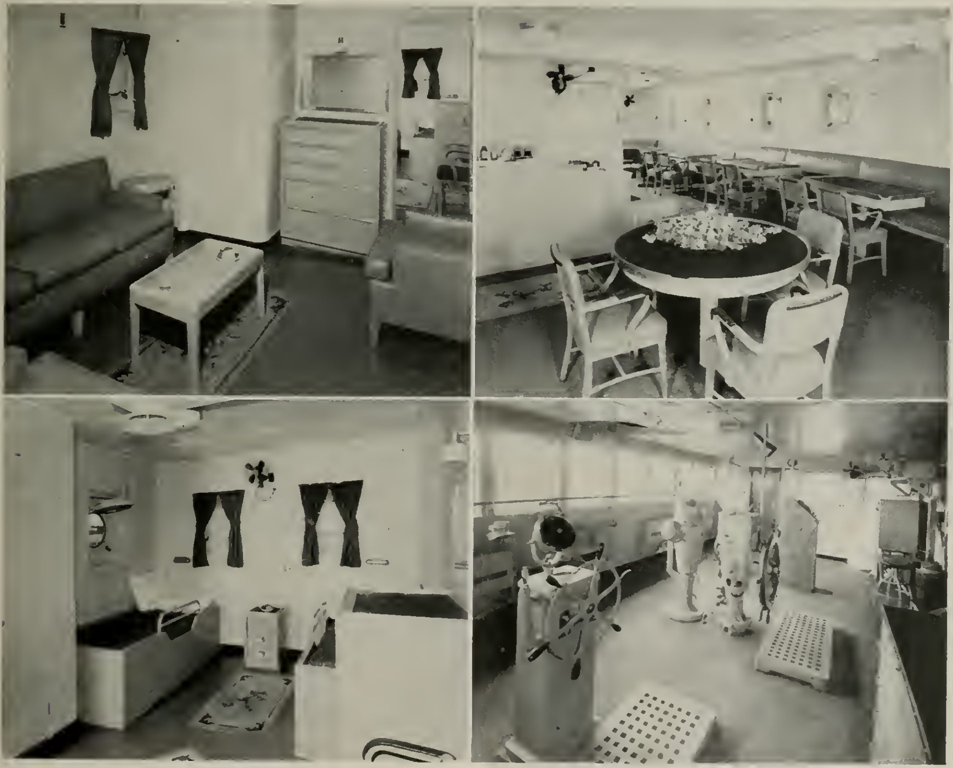
Propulsion

General Electric 8500 horsepower compound steam turbine is the main propulsion unit, and the turning gear, motor, control, resistor frame and cam switch are also General Electric's.

Tail and line shafting was made by Bethlehem, while the four-blade right hand 21′ 8″ propeller is by the Cramp Brass & Iron Foundry Co.

Lublicating oil purifiers are DeLaval Separator. Lube oil heaters and coolers are Davis Engineering Corp. Main surface condensers, auxiliary condensers, main &

(Please turn to page 102)



Passenger and officer dining and bedrooms are designed and equipped for maximum sea voyage comfort. Lower left view shows the enclosed bridge with its many navigating instruments.

The Falmouth, East Indiaman of the middle 18th Century.

THE SHIP'S GALLEY

Its Evolution, Present Status and Future Trend

By A. J. Dickie

Food at Sea

NAPOLEON SAID "AN ARMY TRAVELS ON ITS STOMACH." Nelson declared that "A Navy's morale depends on its cooks." Our own Admiral Land wrote "Nothing is more important than good food on shipboard."

During the past century the development of facilities and equipment for storing and preparing food on shipboard has kept pace with the improvements in naval architecture and marine engineering. Today, on modern cargo vessels, the foods carried and the meals served are far more varied and much more palatable than would have been possible on first class passenger liners 60 years back. Refrigeration, air conditioning, ventilation and improvements in galley equipment are responsible for this condition.

Introduction of oil fuel and electricity into the galley makes the job of the modern seagoing chef a much simpler task than was the work of his predecessor in the days of wood and coal fuel. These refinements of culinary and table utensils that would have been scorned by the old Stockholm tar breed of deep sea sailormen are nevertheless great builders of morale in a ship's crew.

In ancient days practically all hard labor was either slave labor or women's work. The slave part of this condition existed at sea as well as ashore. While some classes of seamen were free men, practically all the rowers and probably the cooks and stewards were slaves. For this reason we find very little reference in ancient maritime history to the cooks aboard ship or to the equipment for cooking, although we find many descriptions of banquets both ashore and afloat.

It is probable that the provisions carried in the "Thousand Ships" that carried Greek warriors to the conquest of Troy were very similar to those carried in the galleys and sailing ships of Western Europe, down to comparatively modern times. Hard bread, some sort of salted or smoked meat and fish, and what fresh fish they could catch were the sailor's menu between visits at ports.

Much of the early navigation was coastwise and when provisions ran low purchase or forage ashore was in order. Under conditions existing in Europe, North Africa, and the Near East down to the 15th Century, ventures by sea out of sight of land were real adventures into unknown spaces filled with mysterious forces and monsters of the vasty deep. Only the hardiest souls dared such terrors.

When a few of these heroes had brought back to civilization the tales of islands and continents beyond the seas, many mariners began making long voyages and the feeding of crews and passengers became a very serious problem. Long weeks and months of salt pork, hard tack and duff produced many and various physical ills among seafarers that were grouped under the comcon name of scurvy. On many of the voyages of the 16th and 17th centuries as many as one-half of the ships' personnel would die from scurvy.

In 1775 Captain James Cook, after a voyage round-the-world, during which 46 per cent of his crew died from scurvy, made an intensive study of the problem and decided that scurvy was due to deficient diet and that vegetables and fruit were needed. He prepared carefully for his second round-the-world voyage and stocked his ships with rations which would, in his opinion, supply the missing materials necessary to good health. On return from this voyage his mortality rate stood at one in 118 or less than 1 per cent. His principal source for supplying the lack in the earlier diet was lime juice and rations of this became standard in British ships; hence to the term "limejuicers," applied to British sailors. Although the doughty Captain had probably never heard of vitamins, it was vitamin "C" that was giving him the desired results. Today the various natural sources of that vitamin are requirements in all balanced diets.

Letters of passengers aboard ship during the 16th, 17th, 18th, and even 19th centuries are full of complaint about the nauseating and scanty food served them from ships' stores. Typical is the record left us by a priest of his experiences on a Spanish galleon during the long transpacific voyage from Manila to Panama early in the 18th century. Says he, "The biscuits were so infested with weevils that they (the biscuits) ran about on the table and only the most active persons could catch one, while the beans were so wormy that when boiled they made a worm stew, slightly flavored with bean." Is it any wonder that the sage Dr. Johnson (as quoted by Boswell) remarked in 1750 that "Being in a ship is like being in jail with the chance of being drowned."

Feeding shiploads of passengers on such voyages as Liverpool to Sydney (100 days or more) or New York to San Francisco (110 days or more) presented a real problem before the introduction of refrigeration, ventilation, air conditioning, and the standardization of canning and dehydration. And yet, back in those days, physicians often prescribed such voyages with surprisingly good results to the health of their patients (witness Dana's "Three Years Before the Mast").

The Galley

Just when, how, and why the kitchen on board ship came to be called a galley seems to be an unsolved puzzle. Originally a ship propelled by oars or a combination of sail and oars was called a galley (galleon in Spanish parlance, gallee in French). The oarsmen on these vessels were criminals or slaves and were commonly referred to as galley slaves. The girls who scrub up floors in British kitchens ashore or do the most menial tasks have been referred to as slavey's since Shakespeare's time and before. The cook in old sailing ships had to do all these things as well as cook and on occasion had to get out and work the ship with the crew. He was virtually a slave to his task, his tools, the whims of the skipper, and the abuse of the crew. So the place where he worked may, through the slave association, have come to be known as a galley.

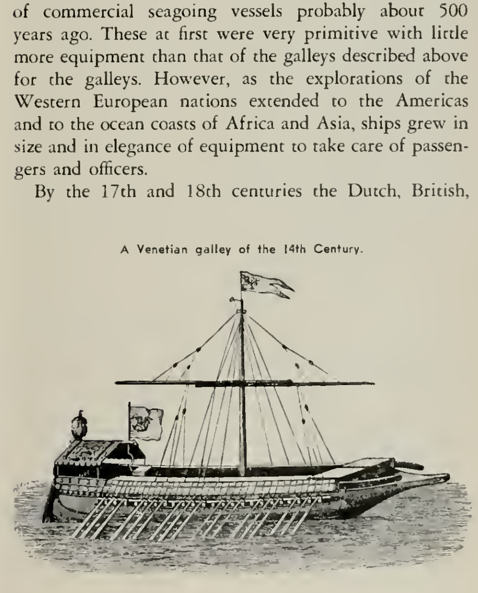
On the other hand, because food is so important to a sailor, the kitchen may have taken the name galley as being the most important space in the ship and hence deserving in itself to take the name given to the whole ship.

In most of the commercial oar and sail propelled vessels known as galleys the cooking facility probably consisted of an open platform, floored with stone and having shields arranged to keep the wind from disturbing the fire. There would be a tripod supporting a large copper pot for stew or soup, a charcoal brazier to broil meat, and a few irons to stir up the fire or the stew. Undoubtedly there were many such ships that had no cooking facilities. Armies and Navies in comparatively ancient times seemed to be able to subsist on dried provisions of various sorts, such as dried milk curd, cheese, dates, raisins, meat, and fish.

In Europe enclosed separate compartments for cooking and preparing food were first included in the design of commercial seagoing vessels probably about 500 years ago. These at first were very primitive with little more equipment than that of the galleys described above for the galleys. However, as the explorations of the Western European nations extended to the Americas and to the ocean coasts of Africa and Asia, ships grew in size and in elegance of equipment to take care of passengers and officers.

By the 17th and 18th centuries the Dutch, British,

A Venetian galley of the 14th Century.



Spanish, French, and Portuguese merchantmen were carrying livestock on deck to assure fresh meat and milk for passengers and officers. On the tables of these ships would be spread the finest hams with raisin sauce, fresh meats, wines, and delicate pastries. But the crew still ate salt horse and hard tack, and where the voyage was long, conditions such as prevailed on the Manila-Panama run would be the rule. On many of the vessels of that period the galley equipment was as elaborate and complete as that of the best kitchens ashore. Semi-open fireplace ranges with iron tops and built-in Dutch ovens, surrounded with an abundance of pots, pans, spits, and large kettles.

Naturally under such a regime the crew hated the cook as they made comparisons between their food and that of the passengers. So, if a cabin boy or a sailor got the opportunity he would slip an old dirty sock or a piece of tarred rope yarn into the savory kidney saute intended for the skipper and passengers. The frequent and desired results would be 12 lashes for the cook to teach him to be more careful, and much merriment among the crew.

During the sailing ship period which lasted practically through the 19th century, probably the most interesting vessels from a culinary point of view were the full-bodied ships of the British East India Company. These hulls were built for comfort, large capacity for cargoes, and sea-easy qualities rather than speed. They were men-of-war as well as merchantmen, were run on naval discipline, and carried every practical equipment for luxurious comfort and abundant diet. Carrying their own fresh meat and dairy, they stocked up on all food-luxuries that could be prepared for the long voyage round Cape of Good Hope to India, and the Straits Settlements. Their Indian dishes on the return voyage were as bountiful and tasty as their British menus outward bound. In fact, these ships and their retired captains introduced to the dining tables of Britain many of the recipes that had long been used in the Far East.

Notwithstanding all the luxury in the cabin however, the crews of these vessels still lived on salt horse and hard tack for dinner with "belaying pin soup and a roll in the scuppers" for supper as the old chantey has it.

Today all this has changed. The modern seaman on the vessel that is fortunate enough to carry a good cook, squares away to meals that are much better than the average workman ashore can afford to feed his family. The finest of meats, fish, and poultry are carried hard frozen in practically every American cargo vessel. Fresh eggs, choice fruits and vegetables, jams and preserved fruits, creamery butter, puddings, pastries, and ice cream, are now regularly on the American seaman menu.

Galleys have greatly improved in their layout and equipment. Modern ranges and ovens either electrically or oil fired, permit dependable methods of temperature control. Scientifically designed soup kettles and coffee urns and pressure cookers; sanitary, vermin and insect proof methods of storing provisions; ventilation, air-conditioning, and refrigeration, all combine to produce better results from the work of the seagoing chef. Electrically operated slicers, grinders, mixers, dishwashers, and garbage disposers, are provided to make the physical work of the chef lighter. His service refrigerator keeps every item of food in prime condition up to the time of use. Cooled potable water, milk, and other drinks are available. Ample electric power is obtainable by pushing a button.

So today the sailor afloat get to eat practically everything that the worker ashore can get and gets more of it than his brother ashore can afford to buy.

Herewith is a sample day's menu as recommended by the War Shipping Administration.

Breakfast

Grapefruit Juice — Oatmeal with milk
Eggs Cooked to order — Pork Sausage or Buckwheat cakes
Bread or Rolls
Jam — Butter
Coffee, Tea, Cocoa or Milk

Dinner

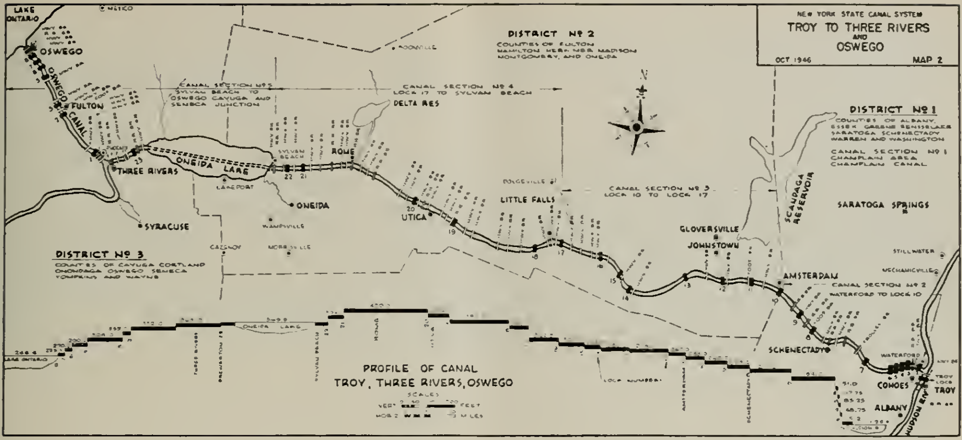
Cabbage Relish — Green Split-Pea Soup
Baked Sugar Cured Ham
Pineapple or Raisin Sauce
Diced Beef Hash
Spinach — Buttered Carrots
Fried Sweet Potatoes
Bread or Rolls
Jam — Butter
Orange Layer Cake
Coffee, Tea, Cocoa or Milk

Supper

Green Vegetable Salad
Veal Steak Saute
Spaghetti, Meat Sauce, Parmesan Cheese
Buttered Green Beans — Baked Potatoes
Bread or Rolls
Fruit Gelatin with Custard Sauce
Coffee, Tea, Cocoa or Milk

With such menus spread before them our sailors should be showing a very high morale and a great willingness to work if only for the purpose of creating a good appetite so that they could really enjoy all these feasts.

In following articles we shall try to trace in detail the development of the ship's galley and to illustrate this development with galley layouts and pictures of galley equipment from characteristic vessels.



HIGH LIGHTS OF REPORT ON NEW YORK HARBOR

Monumental Study by Joslyn & Ryan of San Francisco

THE PORT OF NEW YORK AUTHORITY at a meeting of canal operators, shippers and receivers of freight and other businessmen at its headquarters, 111 Eighth Avenue, have just released a report on a survey of the traffic and equipment of the New York State Canal System. Port Authority Commissioner Eugene F. Moran, chairman of the Board of the Moran Towing and Transportation Company, and one of the leading experts on shipping in the Port of New York, was chairman of the meeting and reviewed the importance of the Hudson River and New York State Canal System to the New York-New Jersey harbor area.

The Port Authority survey includes a detailed analysis of the type and volume of commodities moved over the New York State Canal System since 1931. It reviews the traffic and equipment situation and makes recommendations for the improved design of efficient types of barges and motorships for canal use, and suggests terminal improvements.

The report, prepared at the request of the Port Authority, by Joslyn and Ryan, naval architects and marine engineers of San Francisco, was reviewed by Walter P. Hedden, the Port Authority's Director of Port Development, and E. M. Breingan of the surveying firm. At the same time, Fred R. Lindsay, New York State superintendent of operations and maintenance, and Colonel W. F. Heavey, United States district engineer, reported on the status of the bridge clearance and channel deepening program on the canal between Lake Ontario and the Hudson River. This program is a part of the Federal improvement project now nearing completion. M. B. Kelly, president of the New York State Waterways Association, reported on the efforts of canal operators to correct the canal rate structure and its relationship to depressed railroad rates.

Commissioner Moran pointed out that the modern waterways system connecting the Port of New York with the Great Lakes has handled nearly five million tons of commerce a year. Motorships and barge fleets on the system can move the equivalent of the contents of 150 railroad freight cars in one round trip. "The four-foot ditch of Erie Canal days is now a canalized system of rivers, lakes, and land cuts, with a controlling depth of twelve feet and locks that in some cases compare with those of the Panama Canal," he declared. "The Hudson River and New York State Canals make it possible for the Port of New York to compete with the Port of New Orleans, served by the Mississippi, and the Ports of Montreal and Quebec, served by the St. Lawrence, for midwestern commerce."

Commissioner Moran recalled that the Port Authority has been keenly aware of the value of the waterways system in handling grain, sulphur, woodpulp, iron and steel and other important commodities en route to and from the Port of New York. The Port Authority took a leading part in supporting the $27 million Federal improvement of the system from Lake Ontario to the Hudson River. This improvement will effect a 40 per cent increase in the potential boat capacity, and will enable boats with superstructures and deckloads to navigate the waterway. The Authority also helped to maintain the canal on a basis comparable with the St. Lawrence and Mississippi systems when the railroads attempted to wipe out the benefits of canal transportation through the imposition of tolls in New York State alone.

"The canal is in excellent shape and the Federal Government is moving ahead with its improvement program," Commissioner Moran continued. "But there has been a serious reduction in shipping units for the handling of dry cargo on the canal. Great injury was done to the canal fleet during the war when some of the boats were subjected to unusual usage, and others were put into coastwise service and equipped with superstructures during the period of submarine activities. The superstructures are too large to permit canal navigation."

More Barges and Motorships Needed

The marine expert said that canal operators would agree to replace worn-out and obsolete tonnage with modern barges and motor ships, provided they could be designed, built and operated economically. "I know that an operator must have a barge fleet or motorships that can be operated economically on the canal seven months in the year and in the New York Harbor or along the coast during the winter seasons," he added.

The Port Authority has cooperated with canal operators in their efforts before the Interstate Commerce Commission to establish a reasonable relationship between water rates and rail rates on carriers serving the canal area. Mr. Hedden emphasized the importance of the canal system as New York's most important instrument in meeting the competition of the toll-free Mississippi and St. Lawrence systems. Every port from Philadelphia to Galveston has a railroad rate advantage over New York ranging from 60 cents to $3.60 a ton.

"Beginning with a little over a million tons in 1918, there was a steady growth in canal traffic until it reached a peak of over five million tons in 1936, an increase of about 15 per cent a year," Mr. Hedden stated. "Immediately before the war canal tonnage fell off, and during the war years dropped to a low point of about two and a half million tons in 1944. There has been some small recovery in the last two years. The wartime sag in traffic was not confined to the New York State Canal System. The St. Lawrence showed the same downward trend. A part of this decline reflected the need for speedy movement of wartime materials. In addition, the traffic was affected by the diversion of canal equipment to other purposes on other waterways."

There were 461 dry cargo barges available for use in 1936, compared with 55 in 1946. Steel barges were reduced from 27 in 1936 to 19 in 1946. Mr. Hedden said that some new equipment is going into the canal every year. But the uncertainty of available traffic and rate cutting causes private capital to be somewhat reluctant to invest in new inland waterway units.

The State of New York in May 1944 transferred to the Port Authority its grain terminal property on Gowanus Bay in Brooklyn. Mr. Hedden indicated that the two million bushel grain elevator and a new gallery for loading directly into ocean ships are important terminal facilities for canal traffic. The Port Authority provides a mooring rack for over 75 barges and will furnish upland space for the discharge and assembling of open top barge cargoes for westbound movement.

High lights of Mr. Breingan's review of the Joslyn and Ryan report included the recommendation of all-welded barge suitable for operation on the lakes and the New York Harbor and seaboard, as well as the canal. The all-welded barge would be lighter in weight than a riveted job, would have a 20 per cent greater carrying capacity, greater buoyancy and therefore more space above the waterline for deep sea operations. One great advantage in the new design would be found in the sliding hatch covers which would enable quick operation equal to ocean standards.

New cargo handling devices on the large barges would include five-ton removable cranes so that boats carrying woodpulp, rubber, lumber and containers of miscellaneous merchandise would be self-loaders and unloaders. Mechanical handling of bulk cargoes such as sugar and sulphur would improve the service and reduce the cost of the operation. Such mechanical handling would help hold down labor costs by making it possible for jobs to be done within the regular eight-hour working day.

Mr. Breingan explained that the Joslyn and Ryan survey developed five new barge designs, ranging from four-in-one-tow up to a large single unit barge. The study revealed that the net earning power of a combination of three or four barges would be greater than that of a single large barge. A motorship design included refrigerator compartments.

War surplus materials reported available included three army and two navy types that might be economically converted if the original purchase price were low enough.

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From left to right: Closeup view of dredge Pacific's damaged wheelhouse. The seagoing hopper dredge Pacific, damaged by collision with runaway Liberty ship during typhoon at Okinawa, shown on drydock at Bethlehem's San Francisco Yard. Dredge Pacific, showing damaged plates removed and new plates being installed.

BETHLEHEM REPAIRS FOUR DREDGES

By GEORGE P. HURST

Mining and Dredging Department, Bethlehem Steel Company, Shipbuilding Division, San Francisco Yard

ALTHOUGH THE DREDGE is almost always thought of in connection with the unpleasant but necessary function of removing mud and silt from harbor mouths or widening harbor channels, it nevertheless represents a very important factor in the economic life of American coastal and inland waterways systems. It has a rugged, dirty job to perform and as a result must always be kept in tip top operating condition.

Having built the first successful gold dredge in America in 1897 and maintained facilities for repairing and providing replacement parts for all types of dredges ever since, Bethlehem's San Francisco Yard is in an enviable position for performing this type of work. Recently the Yard had the rather unique experience of repairing four dredges, all of which were in the Yard at one time. Two of these were seagoing hopper dredges, one a clam shell type and the other a hydraulic suction dredge. The latter, the *Papoose*, owned by the Hydraulic Dredging Company, Ltd., of Oakland, was built by the Yard in 1929. The *Pacific*, one of the seagoing hopper dredges, also was built by the Yard, although some eight years later. The *Pacific* has a displacement of 865 long tons, an overall length of 180 feet and a beam of 38 feet, and is owned by the Corps of Engineers.

The Pacific at Okinawa showing damage suffered following typhoon.

During the war the dredge *Pacific* was loaned by the Corps of Engineers to the Navy for work in the South Pacific. War's end saw her at Buckner Bay in Okinawa, dredging channels and making harbors. She was placidly carrying on these routine operations when a 135-mile typhoon struck the island, tearing ships from their moorings and causing considerable damage both to them and to installations on the island.

The *Pacific*, with both anchors down and her propellers turning, kept into the wind and was successfully riding out the storm when a Liberty ship, her anchor

chains broken and out of control in the heavy wind, crashed into the starboard bow of the dredge, then swung around and crashed the pilot house. The force of the impact carried away the *Pacific's* two anchors and, helpless before the wind, she drifted onto the beach, where she lay for 5 days. She was then towed off, leaks in the bow were patched and in successive stages she was towed back to the United States.

Bethlehem's job was to put her back in shape after her rough beating. She was drydocked and a large number of shell plates high on the starboard side forward were removed, renewed or faired in place. The pilot house and drag tender's house had to be rebuilt. Gear for operating the drag pipe davits had to be overhauled as well as the pump engine and pumps. Maintenance overhaul work in way of the dredge hoppers also was performed and a new radio direction finder and gyro compass installed.

The *Pacific,* spick and span with her new red and yellow paint has now left the Yard to resume work for the Corps of Engineers.

At the same time as the *Pacific* was being reconditioned Bethlehem was installing hull extension sections on the *Papoose.* These sections, 7 feet wide and approximately 20 feet long, were prefabricated at the Yard and then welded to the hull for its entire length.

The clam shell type dredge *Holland,* owned by the Olympian Dredging Company and leased to the Corps of Engineers for South Pacific war duty, saw much service in the Pacific. While being towed back to this country from the war zone, together with another vessel, it encountered a heavy storm. The tow rope parted and dredge and ship went adrift. Both suffered damage when they repeatedly struck against each other in the heavy seas. The *Holland,* which will soon leave the Yard for private dredging operations, has its damaged hull repaired, its machinery overhauled, a new main boiler installed and a new coat of green paint.

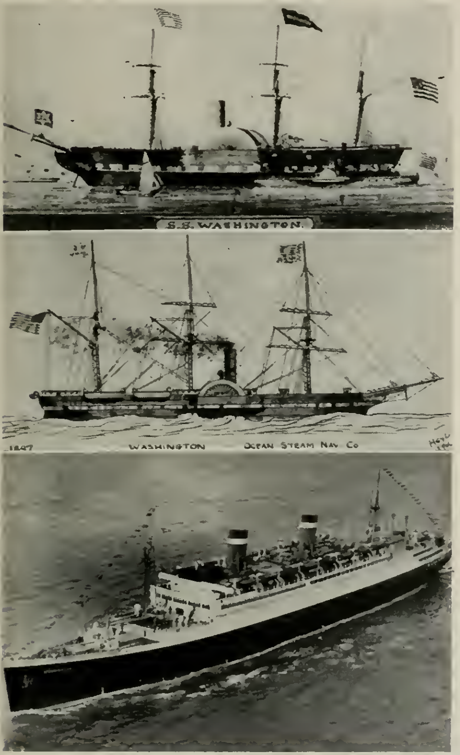
The seagoing hopper dredge *Kingman,* also owned by the Corps of Engineers, in the meantime was undergoing a general overhaul. It was drydocked, painted, its hoppers were patched up and its diesel engines and dredge pump dismantled and repaired.

Last year alone Bethlehem's San Francisco Yard repaired a total of eight dredges. This year it is well on its way to topping this figure and indications are that it will.

From top to bottom: The seagoing hopper dredge Dan C. Kingman, owned by the Corps of Engineers; the clamshell type dredge Holland at Bethlehem's San Francisco Yard; the Papoose being drydocked prior to installation of hull extension sections.
At bottom: Closeup view of hull extension sections which have just been welded to starboard side of Papoose.

THE STEAMSHIP HISTORICAL SOCIETY RELATES YARN OF FIRST S.S. WASHINGTON

THE BEGINNING OF SCHEDULED OCEANIC SERVICE by American steamships marks its 100th anniversary June 1, 1947, the Steamship Historical Society of America stated. On that date in 1847, the 1,600 gross ton steamship *Washington,* owned by the Ocean Steam Navigation Co., America's first transatlantic steamship line, set sail for Bremerhaven from New York.



At top: Two views of the 1847 liner Washington, whose departure from New York on June 1, 1847, marked the beginning of oceanic steamship service under the Stars and Stripes. The upper illustration shows her as she was depicted in a contemporary print. The lower is a drawing made by Erik Heyl, member of the Steamship Historical Society of America. At bottom: The United States Line's S. S. Washington, second largest vessel in the American Merchant Marine and inheritor of the name and tradition of the 1847 Bremen Line steamer Washington, the centennial of whose departure from New York was celebrated June 1, 1947.

The *Washington* was the first steamship built in the United States for transoceanic service. She was the first steamship to sail between New York and Bremen. She was the first steamer to have separate first and second class cabins, each with their own public rooms.

Boasting a full-length figurehead of George Washington, this steamer was the first of a long line of famous vessels to so honor "the father of his country." Today, America's second largest transatlantic liner built for the United States Lines, carries on this famous name. the present-day *Washington,* over 20 times as large as the earliest *Washington,* is now undergoing reconversion after serving throughout the war as a transport. She will soon join the United States Lines' *America* in the North Atlantic passenger service.

The first *Washington's* maiden voyage will long be remembered. Her departure from New York, June 1, 1847, was the occasion for a tumultuous celebration.

After a brief stop at Cowes, Isle of Wight, the *Washington* made for Bremerhaven, where her arrival caused a sensation. She was welcomed by the burgomaster and a large delegation of merchants. A dinner was thereupon given for the vessel's officers and crew, at which the enthusiasm ran high. Spurred on by the spirit of the moment, a member of the serenading orchestra composed a *Washington Polka* on the spot.

The new vessel's appearance presented a curious compromise between sailing ship and steamer design. Except for her smokestack and wheel boxes, she would be taken today for a rather stubby looking clipper ship.

Around the *Washington's* thick wooden sides were painted imitation gunports, such as those on the famous *Constitution.* Her paddlewheels were boxed in with a golden crescent of carved timbers. She carried 112 in first-class and 70 in second.

Perhaps the most exciting event in the vessel's career took place in 1854. Riding out a heavy gale successfully, she sighted a sailing packet in distress. Dismasted and leaking badly, the *Winchester,* out of Boston, was slowly foundering. On board were 477 persons. Their rescue, effected with a single lifeboat from the *Washington* was

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Corrosion and Oxidation Experiences in High Temperature Steam Service

By Paul M. Brister and J. B. Romer

AN ANALYSIS OF THE CAUSES OF CORROSION experienced with metals used for steam generating tubes and superheater tubes in high pressure boilers, and some recommendations as to what can be done to overcome this problem, were presented in a paper delivered before the Louisville Congress of the Electro-Chemical Society by Paul M. Brister, staff engineer, and J. B. Romer, chief chemist, of The Babcock & Wilcox Company of New York.

This paper deals with the corrosion experienced with metals used for steam generating tubes and superheater tubes for high pressure boilers. Methods of relief and interpretation of the causes of corrosion of steam generating tubes are presented. For high temperature superheater tubes it is shown how temperature shock affects the rate of corrosion on the steam side and the gas side of the tube. With the proper selection of ferritic type chromium-molybdenum steel alloys, steam and flue gas corrosion is not troublesome for metal temperatures up to about 1200° F (650° C). Stainless steels are satisfactory for temperatures somewhat above 1200° F. For structural members, such as hangers and supports, chrome nickel steel alloys are preferred for elevated temperature service.

In considering this problem in the field of steam generation, it would seem advisable to briefly review the equipment used and the ranges of temperatures and pressures to which the different parts of the equipment are subjected during normal operation. Three popular types of modern high pressure boilers are illustrated in Fig. 1 to 3 inclusive.

In these three types of boilers the furnace temperatures are of the order of 2800° to 3200° F (1540° to 1760° C); actual temperatures depend on the fuel characteristics and, in the case of coal burning units, whether the coal ash is removed dry or as a liquid slag.

Figure 4 illustrates the temperature gradient from the gas side to the water, and shows how the thermal resistance of internal scale increases the metal temperature.

The superheater metal temperatures will be slightly higher than the temperature of the steam in the tube when the tube is clean, but this also may increase considerably if an internal deposit is formed.

Metal Temperatures

The temperature of the metal in any steam generating tube will be very close to the water temperature if the

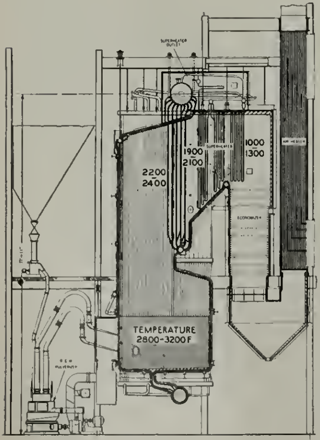


FIGURE 1
RADIANT BOILER

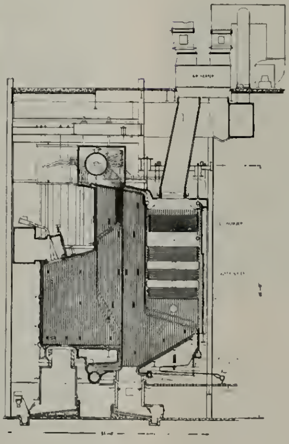


FIGURE 2
OPEN-PASS BOILER

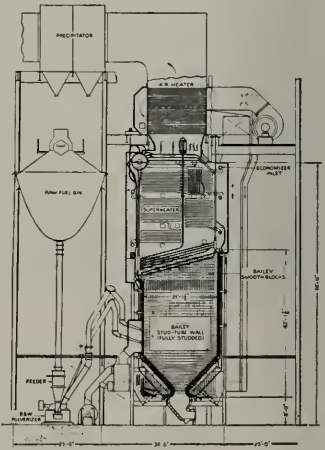
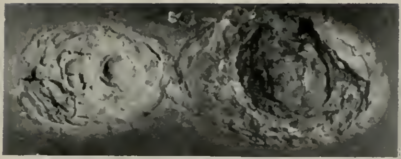
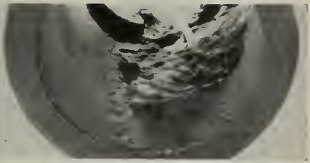


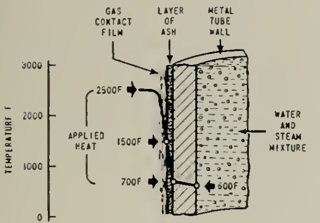
FIGURE 3
HIGH-HEAD BOILER

Left, Fig. 5: Interior view of corroded tube. 1 Diam.

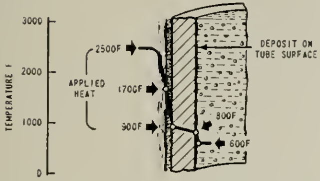
Right, Fig. 6: End view of interior of tube, pits and barnacles. 1 Diam.







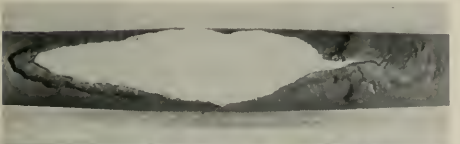
(a) WITH CLEAN SURFACE ON WATER SIDE OF TUBE



(b) WITH DEPOSIT ON WATER SIDE OF TUBE

FIG. 4

EXAMPLE OF THE TEMPERATURE GRADIENTS EXISTING WHEN TRANSFERRING HEAT FROM HOT COMBUSTION GASES TO WATER AT SATURATION TEMPERATURE



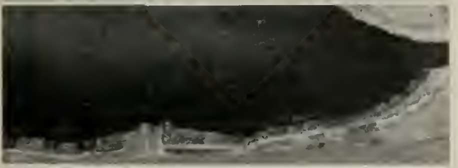


Fig. 7, at top: Interior view, segment blown out. Same tube as Fig. 6. ½ Diam.

Fig. 8, below: View of fracture in tube wall, same tube as Figs. 6 and 7. 1 Diam.

tube is clean internally, but can increase to a considerably higher value if any scale, oil, corrosion product or other low thermal conducting materials are deposited on the steel surface.

Corrosion and Oxidation Experiences

It is quite apparent that the metals in different parts of a steam generating unit operate under different conditions of temperature, stress, and fluid content.

For the purposes of this paper our corrosion and oxidation experiences with those metals generally used in boilers has been classified into three groups:

A. Metals used in steam generating tubes.

B. Metals used in baffles, hangers and supports located in high temperature gas streams.

C. Metals used in superheater tubes.

These will be discussed in the above order.

A. Metals Used in Steam Generating Tubes

These metals are in contact with water or a mixture of water and saturated steam. Here the saturation temperature is of the order of 540° to 685° F (280° to 360° C).

This includes steam generating tubes, furnace wall and floor tubes, etc., where the gage pressure is in the range of 950 to 2800 lb./sq. in (66.5 to 196 kg./cm.^{2}) and where hot gases at temperatures of 1000° to 3200° F (540° to 1760° C) are transferring their heat through the metal to the water. Attemperators represent a special condition in that the water side of the tube is as just described, but the heating media is superheated steam at 850° to 950° F (450° to 510° C).

In practically all cases coming under this heading the tubes are carbon steel and conform to one of the following American Society of Mechanical Engineers' specifications (Table I).

TABLE I

Analyses of Steel Tubes

Steel	SA-192	SA-210
Carbon	0.08 to 0.18	0.35 max.
Manganese	0.30 to 0.60	0.80 max.
Phosphorus	0.04 max.	0.04 max.
Sulfur	0.045 max.	0.045 max.
Silicon	0.25 max.	0.10 min.

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*Excerpt from a paper presented before The Electrochemical Society, Inc. at its 91st Meeting at Louisville, Ky., on April 12, 1947.

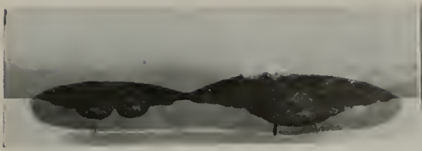

Fig. 9. At extreme left: Section of same tube as Fig. 5 after deep etching. 1 Diam.

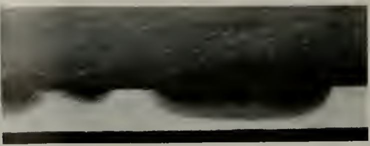

Fig. 10: Longitudinal section through another corroded area after deep etching. 1 Diam.

A number of high pressure boilers have experienced an unusual type of serious corrosion on the water side of their steam generating tubes. Chemical analysis of the boiler waters have shown that they are comparable with units free from this type of corrosion. Boiler waters are in aqueous alkaline solution having a pH of the order of 10.0 to 11.5, and contain sodium and potassium chlorides, sulfates, hydrates, phosphates and carbonates, some silica and small amounts of calcium and magnesium salts.

Figure 5 is an interior view of a corroded area in a tube. The corrosion products have not been disturbed. Subsequent examination revealed severe pitting and intergranular disintegration.

Figure 6 is an end view into a tube showing, near the top of the photograph, deep corrosion pits and near the center a growth of hard barnacles. The corrosion products were not disturbed.

Figure 7 shows an interior view of a tube, from which a segment blew out while the boiler was in service. Corrosion and barnacle formation and location where segment blew out are well illustrated. Any corrosion products were either removed as they formed or blown out at time of rupture.

The next feature which we wish to illustrate is the condition of the metal in these areas. Figure 8 shows the appearance of ruptured wall; near the center a small piece was removed for detailed examination; at this point the wall was nearly full thickness, thinning by corrosion is quite apparent. A narrow light-colored band represents the only unaffected metal at this location.

If a sample is cut through one of these locations, ground smooth and then deep etched in hot acid, a definite dark zone develops. Microscopic investigation of adjacent areas, not so etched, reveals that these areas are a maze of intergranular fissures.

Figure 9 is a photograph showing the effects of deep etching. This section was cut from the corroded area illustrated in Fig. 5. Figure 10 is another example of the effects of deep etching. Figures 11 and 12 are cross-sections of tubes which were deep-etched and photographed.

Photomicrographic Studies

Micro-examination reveals several interesting features. At high magnifications it is found that both large and very fine cracks or fissures are present. The large cracks are in the first layers; they may or may not start at the surface; they are filled with a mass of material quite similar to the hard deposit on the inner surface.

Figures 13 and 14 illustrate the coarse fissures or intergranular disintegration. The two views are of fields almost adjacent to each other and represent the unetched conditions at 500 diameters magnification. Figures 15 and 16 are examples of the fine cracks or fissures found throughout the deeper parts of the damaged areas. Again these are unetched fields at 500 diameters. Fig. 17 illustrates the pitted condition of a specimen polished for micro-examination and etched with 5 per cent nital.* The original photograph was at 9 diameters. Figure 18 is a typical etched area showing the intergranular nature of the cracks. Decarburization is also to be noted. This is an etched field at 1000 diameters.

Figure 19. In the areas immediately below the damaged areas the metal is found to be normal lamellar pearlite as is illustrated in this photomicrograph at 1000 diameters after etching with 5 per cent nital. These experiences, while quite serious, are not prevalent and therefore the quest has been to determine the conditions, peculiar to these units, which cause these abnormal failures. So far they have occurred only in high pressure units.

Metallic copper has been observed in numerous units that were free from this type of trouble; however, as far as the authors are aware, copper or copper oxide has always been present at the locations where these failures occur. With the exception of the occasional use of copper gaskets in economizers, copper is not a boiler material, therefore we must look outside the boiler for the source of this metal.

In order to develop an adequate theory it is necessary to satisfy a number of questions which may appear to be contradictory.

(1) Copper is known to be present in many boilers and frequently in high concentrations, yet in most such cases no corrosion or other attack appears beneath these copper deposits.

(2) Dissolved oxygen is sometimes present in feedwater and in such cases pitting without intergranular disintegration is noted.

(3) Ammonia is frequently present and is not associated with any other type of attack on boiler steels.

(4) This type of attack has not followed the acid cleaning of many units.

(5) Black oxide of iron is frequently present in high percentages in the sludges found on steam generating surfaces, usually such masses are soft and porous.

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*A solution of nitric acid in methyl alcohol.


Fig. 11: Cross-section through another corroded area after deep etching. 1 Diam.


Fig. 12: Cross-section through another corroded area after deep etching. 1 Diam.


Fig. 13: A typical example of coarse fissures. Unetched. 500 Diam.


Fig. 14: Another typical example of coarse fissures. Unetched. 500 Diam.


Fig. 15: A typical example of fine fissures. Unetched. 500 Diam.

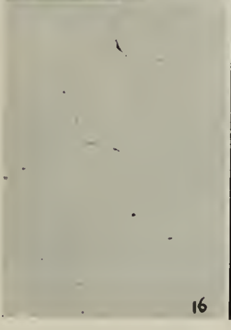
Fig. 16: Another typical example of fine fissures. Unetched. 500 Diam.


Fig. 17: A typical pitted area as developed by etching with 5% Nital. 9 Diam.

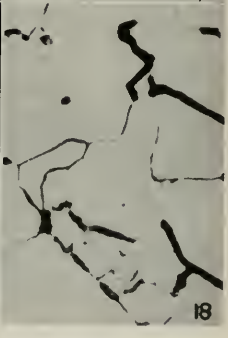
Fig. 18: Intergranular cracks and decarburization. Etched. 5% Nital. 1000 Diam.

It would appear to the authors that the following conditions hold:

(1) The role of ammonia is primarily that of a vehicle which transfers the copper from heat exchanging equipment to the boiler.

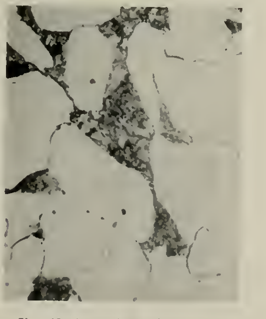
Fig. 19: Normal pearlite below damaged areas. Etched. 5% Nital. 1000 Diam.

(2) In the absence of dissolved oxygen, then a film of iron oxide forms as a result of the iron-steam reaction. This film, if not damaged, stops further attack; if damaged, it reforms and considerable metal may be converted to the oxide. The structure of this oxide is such that the hydrogen, simultaneously formed, is able to escape into the water-steam mixture and intergranular attack does not occur.

(3) Dissolved oxygen creates pits filled with hard barnacles of black oxide of iron. This reaction, $3Fe + 2O_2—Fe_3O_4$ does not liberate hydrogen.

(4) When the combination of ammonia, copper and oxygen exists, then we have at least one additional factor involved, namely, a galvanic couple which creates an anodic condition beneath the barnacles resulting in corrosion of the metal, and simultaneously the evolved

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A. D. Johnson, chief, Marine Lubricating Engineer, Bert Folda, (asst. to manager) Lab. Dept.; E. C. "Ed" Hochuli, manager, Marine Sales (N. C.) of General Petroleum Company.

. . . With The CARE OF LUBRICATING

By A. D. JOHNSON,
General Petroleum Corporation

At a well-attended dinner meeting of the Society of Port Engineers of San Francisco on June 4, three representatives of General Petroleum Corporation conducted a forum on the care of lubricating oils.

Introduced by E. S. Hochuli, manager of Marine Sales, Northern California Division, A. D. Johnson, chief Marine Lublication engineer and Bert Folda, manager Lubricating Laboratory, who traveled from Los Angeles for the occasion, spoke on the general subject and answered the technical questions of the members over a two hour period. A condensed version of Mr. Johnson's talk is given herewith.

THE COST OF A CHARGE OF GOOD LUBRICATING OIL represents a very small percentage of the total cost of a vessel, but, if it is not properly cared for, it may result in cost (due to expensive repairs and lay-up time) exceeding profitable operation.

The oil industry is constantly spending millions of dollars in research to improve the manufacture of lubricating oil, to reduce the cost and to extend its service life. Care equal to that of the food industry is taken to prevent contamination and to deliver it at maximum purity.

Since lubricating oil is a physical material, it reacts to physical laws controlling its many compounds. There is no such thing as an indestructible oil; a constant change chemically is taking place in its structure from the time it enters the lubricating system until it is no longer serviceable. Many of these reactions we understand and control. Ultimately we hope to reach the dream of every lubrication engineer and control the rate of chemical change in lubricating oil to the point where its service life will exceed that of the machine it lubricates.

At present, the makeup of fresh oil to the system, efficient oil purification equipment properly operated, and good practice in the engine room have extended the service life of turbine oils to a reasonable period of time. Addition of fresh oil adds new life to the oil and resistance to the contaminating materials. Good engine room operating practice reduces through good maintenance, the rate of contamination. Purification equipment removes the greater part of contaminating agents that might damage the oil.

New oil has passed through all the modern methods of refining that remove the unstable compounds that Mother Nature placed in raw crude and which accelerate its destruction when heat is applied in the presence of oxygen. The compounds that promote the formation of acids are also removed. Then there are added the "addition agents" to deter oxidation, rust and other evils. These addition agents play various parts in offsetting the influence of contaminating agents. They cannot, however, be regarded as "cure-alls".

In the end, we find that the service life of any lubricating oil is directly in proportion to the care it receives. The operating engineer plays as big a part in prolonging its life as the engine designer, the petroleum technologist or the lubrication engineer. All are part of a four-man team.

Now as to the part the engineer aboard ship plays in this four-way deal. First comes the purification equipment. It should be so designed that its normal capacity will exceed the normal rate of contamination. In the case of centrifuges, care should be taken in the installation of the proper ring dams, frequent cleaning and inspection of the bowl, and control of the flow of oil through the centrifuges at the most efficient rate so that clean oil will be discharged into the system.

In the case of filters, the proper type elements should be installed for the particular oil to be filtered. The manufacturers supply filter elements for all types of oils, so this presents no problem. To test equipment, the

Port Engineers . .

TURBINES

Partial showing of members and guests at the June 4 meeting of the Society of Port Enthe Society of Port Engineers in San Francisco.

engineer need only take samples of the oil as it enters and as it leaves the equipment. The oil supplier will test these in his laboratories, and, if the equipment is doing a good job, should get "nil" or "trace" results for the percentage of sediment by centrifuge and the percentage of water.

For all practical purposes, there are five conditions that will accelerate the reduction of the oil's service life. They are heat, oxygen, metals, water and foreign materials that accidentally enter the system. Let's consider them in that order.

Generally speaking, each 17 to 19 degrees F. increase in temperature above approximately 150 degrees F. doubles the oxidation rate of the oil. Normally, the temperature of the oil in the sump tank should be maintained between 120 and 140 degrees F. This can be accomplished easily by controlling the rate of flow of cooling water. Hot spots, such as bearing overheating or improperly lagged steam pipes too close to oil lines can materially increase the oxidation rate and should be corrected at once.

As to oxygen, it is impossible to entirely prevent oxygen from entering the system. However, it can be materially reduced by not allowing leaks to remain in oil suction lines; by installing sufficiently large return lines from pedestal bearings to the sump tank; by placing all return line discharges sufficiently below the working level of the sump tank to prevent splashing or to flatten out the return line discharge and direct it against the side of the sump tank in such a manner that in a thin film flowing down the side of the tank, all air will be allowed to escape.

Careful attention should be given to all ventilator caps on gravity tank sump tank, gear case and oil separators, to make sure that the protective screens are clean and free, allowing free air passage and preventing back pressures.

It is hard to realize how much metal a lubrication system can carry around in suspension, this coming from gradual wear of the gears and rusting. The statement was recently made that many of our ships are actually operating with as much as a cubic inch of metal suspended in the lubricating oil system. In view of this, it is extremely important to keep as much metal as possible out of the oil. An efficient purification system should accomplish this.

Water is the most prominent contaminant we have to deal with. The answer to this problem is proper ventilation of the lubricating oil system to remove the humid air that forms within the circulation system. In marine practice, natural ventilation is the form most commonly employed. The main sump, gravity, storage and settling tanks are provided with ventilation fixtures; sometimes the gear case and bearing pedestals also are so equipped. The important thing is to keep the screens clean so the ventilators can function. Salt water is extremely harmful in lubrication systems. It sometimes enters the system through leaky joints in oil coolers or defective manhole-cover gaskets on sump tanks which may, at times, be below bilge water level. Leaking shaft seals is a source of fresh water contamination.

It is good practice to remove samples of oil from the line daily, allowing them to stand in a bottle to observe the amount of water that separates.

Other contaminants consist of fixed oils which may enter the system by accident, such as linseed oil and olive oil. All deck fill caps to storage tanks should be plainly marked and, if possible, locked. If other types of oils are to be passed through the purifying equipment, the engineer should make certain that the discharge is not connected to the turbine system.

Still other contaminants include solids, such as sand, dirt, welding beads, bolts, and wiping rags that may have accidentally been introduced into the system.

Here is a procedure that will add years to the life of turbine oil if it is religiously carried out:

When the vessel is in port and sufficient time is available, pump the entire oil charge into a clean settling tank and heat it to 160 degrees F. Shut off the heating system and allow it to cool without any further agitation.

While the oil is cooling, use the hand pump to remove any oil, water or pumpable settlings remaining in the

A group of officers and governors of the San Francisco Society of Port Engineers taken at the June 4 meeting. Left to right: Marshall Garlinger, Harold Wright, Joe Riemers, Ray Sample, Joe Gisler, Frank W. Smith, and Chester McKay.

sump tank. Open the manhole and clean the tank manually. After cleaning, the watch engineer should personally inspect the tank for cleanliness in order that no foreign matter will be left in the tank due to carelessness. Replace the cover of the sump tank.

The oil should now have cooled to 100 to 110 degrees F. This cooling and settling process allows the water and insoluble materials to settle to the bottom of the tank and, while the cooling is going on, any products of oxidation which were soluble at high temperatures and insoluble at lower temperatures will also settle out.

The centrifuge bowl should also be cleaned prior to bringing the entire batch of oil down through the centrifuge, therefore not delaying the operation by stopping the centrifuge to clean the bowl.

The entire charge should be removed from the settling tank via the lowest discharge point, in order that no serviceable oil be lost. If the time element becomes important and it is necessary to increase the flow rate through the centrifuge by reheating the oil, one third of the batch should be allowed to pass through the centri-

MATSON ENGINEER

William J. Williams has quite a record

(One of a series of sketches on important engineers at San Francisco.)

Wm. J. Williams, who is superintendent engineer of Matson Navigation Company in San Francisco, is well known to the Pacific Coast shipping fraternity and has been with Matson since 1928.

William J. Williams

He has served in various capacities in the engine department on Matson's freight and passenger vessels and has occupied positions in San Francisco and Honolulu in connection with ship maintenance and repair operations.

While in the service aboard an American-Hawaiian Oceanic and Oriental freighter, S. S. Golden Forest, Williams, as chief engineer, performed heroic tasks in order to save this ill-fated ship which had first gone aground on a reef off Avatanak Island and was saved, then after repairs she was three days out of Akutan Harbor, near Kodiak Island and proceeding through a fog when she struck again on Cape Ilktugitak. After a severe struggle to save her Chief Engineer Williams nearly had the repairs accomplished when a storm came up on the fourth day and the vessel became hopelessly flooded. Both Chief Engineer Williams and First Assistant Rhinehart Lellman, who had fought so valiantly, were commended for their efforts by the vessel's owners. In 1928 he joined Matson as 1st Assistant on Golden Fleece, followed by 1st Assistant on Golden Bear in 1929. Later in 1929 he became Chief on the Golden Forest and thereafter on various other vessels ending with the big Monterey from 1937 to 39. In 1939 he was assigned to shoreside duties and in 1946 was made Superintendent Engineer.

During World War II, Williams was general superintendent of the Maintenance Division of Matson's Construction & Repair Department.

fuge before heat is applied. This allows the centrifuge to remove low temperature insolubles which would otherwise return in solution if heat were applied.

This process should be carried out at least twice each year and in conjunction with your daily centrifuge operation, presents the most efficient manner that we know for maintaining your oil in excellent condition aboard ship.

During the war, there was a limitation of experienced personnel; consequently, many ships were placed in commission without first having the turbine lubricating system thoroughly cleaned. The turbine oil then, in its normal travel through the system, became a secondary flushing oil, depositing impurities throughout the system. The majority of the complaints of scoring of the journals and gear teeth, with metals imbedded in the bearings and deposited throughout the system, can be accredited to deposition of impurities at the time the vessel made her maiden voyage. We have observed this condition many times in vessels we have inspected. Sometimes the deposits are light—sometimes they are heavy, and in conjunction with this, chemical analysis did not always indicate a high neutralization number or high sediment by centrifuge. We have had some cases where this condition has shown up by the engineer observing that his centrifuge bowl had to be cleaned more frequently in heavy weather than when the ship did not roll so badly. It is a condition which can result in expensive damage to the machinery and will most certainly reduce the service life of the oil.

Another condition indicating this, is the amount of deposits found in flexible couplings through which the system oil circulates. The flexible coupling rotating at high speed acts as a centrifuge throwing out this material in the coupling; now add to this a normal amount of misalignment and the abrasive materials in the deposits will cause early replacement of the coupling.

In view of this, it is strongly recommended that when

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PORT ENGINEER OF THE MONTH Los Angeles-Long Beach Harbor

"Cy" Cyrus of Union Oil— 31 Years With the Ships

In this little story we tell about R. H. "Cy" Cyrus, port engineer of Union Oil Company of California, home port—Los Angeles Harbor.

Cy hails from Minneapolis. He had eighteen months in the machinery and steel shops there before joining the Navy in 1916. He served in coal burners in the engine department, and was 2nd class engine man up to 1919. Then he went to Newport News and shipped out in Kerr Steamship Company's *Montecello* on the run to Europe. Cy was firing and oiling in those days. (He was also on the *Vernon,* ex-*Kron Prinz Cecelia,* when that ship was torpedoed in 1918.)

By 1920, while Cy was on the *Mount Vernon* as oiler, he was advanced to pumpman. The *Mount Vernon,* it is interesting to recall, had four engines and eight fire rooms.

In 1921 Cy was ashore, returning to his Minnesota homeland, then he came out to the Pacific Coast and joined the Matson Line as 3rd Assistant and served aboard the *Matsonia, Manulani* and *Manukai.* Two years later, 1923, he went with Union Oil Company of California, in San Francisco. By 1925 he had been transferred to Los Angeles, and with the Union tankers and was advanced through grades of 3rd, 2nd and 1st Assistant Engineer. In 1929 he was appointed Chief Engineer. He served as chief engineer in the *La Brea, Montebello, La Placentia* and other tankers.

In 1937 Mr. Cyrus was transferred ashore as Port Engineer for the entire Union Oil tanker fleet. This fleet is now composed of four geared turbine high pressure vessels and three T-2 type tankers, as well as one diesel vessel in service in the Canal Zone, and another diesel tanker is soon to be added to the fleet. From 1940-1941 Cy spent a year at Bethlehem Sparrow's Point yard supervising the Union Oil tanker building program.

Mr. Cyrus is married and has 11½-year-old twins, boy and girl. His hobby? He hopes one day—some day—to go back to certain streams and lakes in Minnesota to see if the fish have changed much since the time he was a boy back there!

Cy is a member of the Board of Governors of The Society of Port Engineers at Los Angeles and also is a director of the storied Bilge Club.

Russell H. Cyrus, Union Oil Company.

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

BUSINESSMEN TO JAPAN

THE OFFICE OF INTERNATIONAL TRADE, Department of Commerce, announces that applications of businessmen for permits to visit Japan will now be accepted. Entry into Japan will begin August 15, 1947, and visits will be allowed for a period of 15 days. However, extension privileges may be granted overseas by the Supreme Commander Allied Powers (SCAP).

Hotel accommodations, transportation, and communication facilities within Japan will be handled by the Japanese under supervision of SCAP. These facilities will be arranged for only in Tokyo, Osaka, Nagoya, Kyoto, but it will be possible to arrange side trips to other nearby cities. Visitors will be required to pay for all services rendered.

At the outset, applications to visit Japan will be considered only for the following purposes:

(a) To purchase goods available for export, or to make arrangements for future purchases of potential exports, or to sell raw materials which Japan requires.

(b) To provide commercial services to expedite the movement of exports and imports between Japan and the United States. These services include bank representation, insurance, and shipping.

(c) To inspect commercial investment interests. Applications for this purpose will be given consideration only after other needs are filled.

Selection of trade representatives to be admitted to Japan will be made on the basis of information submitted to the Office of International Trade of the Department of Commerce, through the Department of Commerce Field Office, Room 306, U. S. Customhouse, San Francisco 11. Special application forms are available, which should be filled out in quadruplicate giving the purpose of the visit, cities to be visited, prewar trade with Japan, or reasonable proof that the visit will contribute to restoration of trade.

OIT will review applications in accordance with the terms of the Far Eastern Commission's policy directive and in the light of information submitted by SCAP as to goods available in Japan, raw materials required, and potential lines of business which may be developed.

Within the limits of available accommodations, the names of all applicants approved by OIT will be transmitted to SCAP. Applicants receiving final approval by SCAP will also require a valid passport, applied for in the usual manner, to the Passport Division of the Department of State, Washington, D. C., through the nearest federal or state court having the right to naturalize aliens, or through the passport agency at New York or San Francisco. If no accommodations are available, OIT will inform the applicant. Applications, however, will be held and processed in the order of their receipt and will be transmitted to SCAP for consideration as soon as accommodations become available.

Applicants will also be required to furnish information indicating financial responsibility, a record of the past experience in handling the type of commodities available for export from Japan, or in the absence of such experience, the applicant should be prepared to provide reasonable proof that his visit will contribute to the restoration of Japanese trade.

Initially, prices will be arranged by negotiation between private purchasers and SCAP. SCAP will provide OIT with a list of commodities available for export, together with such pertinent data as it may have as to quantity, etc. A second list will indicate commodities reserved for government-to-government trade. A third list will indicate those raw materials needed in Japan to further its production programs, with respect to which prospective suppliers will be considered for admission to Japan. SCAP will provide this information on a monthly basis, supplemented by interim reports. All this information will be disseminated by OIT as soon as available.

Preliminary advice from SCAP indicates availability of the following general classes of Japanese products:

Bamboo Products
Ceramics and Chinaware
Glassware
Chemicals and Pharmaceuticals
Cosmetics
Health Supplies
Electrical Supplies and Materials
Measuring and Testing Equipment
Meters and Gauges
Fish and Fish Products
Food and Beverages
Aquatic Products
Household Goods
Surgical and Dental Instruments
Laboratory Instruments
Leather Goods
Scales
Bicycles
Industrial Belting and Hoses
Light Bulbs
Hardwares
Linen Goods
Notions and Novelties
Office Supplies
Paper and Paper Products
Pearls and Furs
Rayon Fabrics and Finished Goods
Rubber and Rubber Products
Vegetable and Flower Seeds
Silk Fabrics
Sporting Goods and Musical Instruments
Wool Yard Goods and Finished Goods.

Due to prior arrangements between the U. S. Commercial Co. (USCC), a government corporation, and SCAP, the former will continue to handle the sale of raw silk and cotton textiles. USCC will also continue to dispose of the 1947 tea crop, but the sale of the 1948 tea crop will be made through private trade channels.

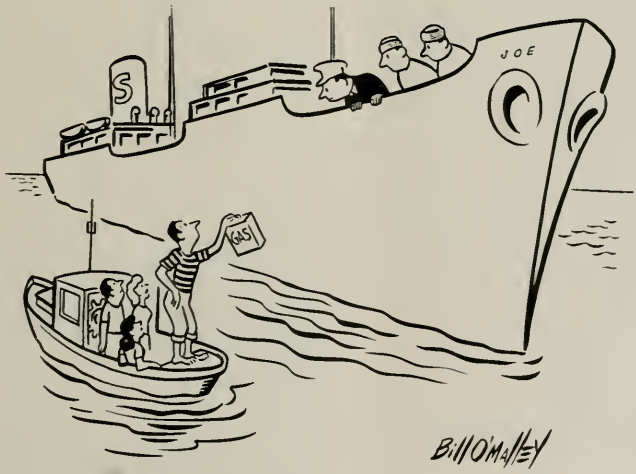
Banks now licensed to do limited business in Japan will render visiting traders the same facilities now authorized for Allied personnel.

Insurance and shipping companies need not file applications for entry with OIT. The State Department will handle their passport applications in the usual manner and will also make arrangements for obtaining the necessary permits from SCAP. The same procedure will be followed with respect to those banks which have already been authorized by the Federal Reserve to establish branches in Japan.

Transactional communications, such as entering into actual purchase and sales contracts, are not yet authorized but will be permitted at the earliest possible date. As soon as possible also, exchange of samples will be permitted between Japanese and U. S. traders. Insurance on export shipments may be obtained either through insurance companies operating in Japan or by coverage obtained in the United States by the consignee.

The Japanese Government will be given full responsibility for fulfillment of contracts. SCAP will undertake no warranty or guarantee of merchandise. SCAP will lend all possible assistance to the Japanese Government in carrying out its responsibilities under consummated transactions.

Subject to the approval of SCAP, acceptance by the Japanese Government of the terms of transactions will be final and binding except that any agreement entered into may be cancelled or modified by SCAP when, in his opinion, unanticipated circumstances adversely affecting or prejudicial to economic occupation aims, make such action necessary.



Courtesy The Standard Oiler

INDIA'S WORLD TRADE MARKET

Development of India's industries during the next few years will open up big opportunities for American producers of capital goods and for American capital and technical skill, Asaf Ali, the first Ambassador of India to the United States, told an audience of 250 members and guests of the Far East-America Council of Commerce and Industry at the Annual Luncheon Meeting of the Council, held at the Waldorf-Astoria Hotel in New York on April 16.

Aside from defense industries, public utilities and key industries such as power production, coal mining, transportation and communications, which will be under government control, the general field of economic development in India will be thrown wide open to private enterprise. American participation will be welcomed both in consumer goods industries and in heavy industries not reserved for government control.

The Indian Ambassador, who as Minister of Transport in the Interim Government played an important part in national economic planning in his country, invited American businessmen to examine the numerous opportunities for trade and industry open to them in India. If they held back too long because of lack of confidence, he warned, they might find that competitors have already captured the market.

Government planning agencies in India, Ambassador Asaf Ali said, have worked out vast plans for development of hydro-electric power, irrigation, transportation and other major projects, some of which are already under way. Several projects of the magnitude of T.V.A. are planned as only a few per cent of the country's huge hydro-electric power resources have been developed in the past. Similarly, he stated, big irrigation developments are being designed to bring under cultivation the one-third of India's cultivable land which now lies idle. The purpose of this program is to make the country self-sufficient in food production. All these projects, which are aimed at raising the purchasing power of India's 400,000,000 people will require large quantities of capital goods and open up many opportunities for technical assistance by American companies.

According to the Indian Ambassador, some of the reports on political conditions in India circulated in this country have been considerably exaggerated. In part, this situation has been caused by the efforts of competitors purposely to give a bad picture in order to discourage American businessmen. A better barometer of the economic possibilities is the flow of trade between this country and India which is now far greater than before the war.

Before the war, India was a debtor to the extent of $2,500,000,000 while at the present time she is a creditor country with more than double that amount owing to her. This fact was cited by the Ambassador as convincing evidence that India no longer has a colonial economy and that she is now able to deal with other countries on a level of equality.

American investments would find safety in India, Mr. Asaf Ali said, asserting that the judicial system in his country is as good as that prevailing in any other part of the world. While India needs a vast amount of capital equipment, American firms must be prepared to give fairly prompt delivery. Otherwise it might be found necessary to place orders elsewhere. Another obstacle to purchases here was the high price of some types of equipment, which has already caused diversion of considerable business, including a recent order for 300 locomotives, to other countries. Later on, he pointed out, there shoud also be a large market for cousumer goods, including luxuries.

Pacific
WORLD
TRADE

NEW NATIONAL FEDERATION OFFICERS

Samuel D. Schell has been elected vice president of the National Federation of American Shipping, to succeed Maitland S. Pennington, resigned, and John B. Ford was elected Secretary-Treasurer.

Mr. Schell, former Executive Director of the U. S. Maritime Commission, served for approximately 28 years in government transportation and Merchant Marine activities. He served in the Corps of Engineers, AEF, in France during the first World War.

He became associated with the U. S. Shipping Board and Merchant Fleet Corporation and was promoted through various positions in Ship Operations, Traffic, and Accounting. Upon the creation of the U. S. Maritime Commission, Mr. Schell remained with the new agency and later became Executive Director. Mr. Schell is an attorney and member of the Bar of Maryland.

Mr. Ford has recently been serving as a Consultant for the Sea-Air Committee of the Federation. He as formerly Assistant to the President, and Attorney, for Northeast Airlines, Inc., and prior thereto was associated with Gambrell and White, General Counsel for Eastern Airlines, Inc.

During the war, Mr. Ford served in the U. S. Navy as Assistant to the Officer in charge of the Navy overseas Air Cargo Terminal at Samar, and at the Navy overseas Cargo Terminal at Honolulu.

At left: The trio facing the camera are: Joseph A. Wagstaff, Laurens H. Killingsworth, and Ted Smith.

At right, top: Joe Marias, speaker of the evening at the Junior Foreign Trade gathering, with Jack Stewart (seated), president of the Association, who looks pleased with a very successful meeting.

Below: Archibald T. Davis, Jr., Samuel H. McConnell, Leo F. Kaufman, Stephen C. Cook, Murray Fox and Neil E. Templeton.

At right: Donald W. Chapman, Jr., Jos. W. Greenland, (name of third man not obtained), and Don W. Becklin.

JUNIOR WORLD TRADE ASSOCIATION NOMINATES

The committee named by President Jack Stewart to pick nominees for the board of directors has come up with the following list:

John L. Stewart, John J. Mulvehill, Jr., Don W. Becklin, Herbert G. Porter, Archibald T. Davis, Jr., Reno J. Franchesi, Charles M. Freeman, Neil E. Templeton, Harold W. Nordberg, George Schmitz, Thomas B. Shaw, Richard L. Schinazi, Jr., Robert C. Weaver, Robert H. Langner, and Allan H. Eber.

From these, nine will be elected by the membership at the election in July, and from among the nine the officers for the ensuing year will be appointed.

Pictured below are the winners of the World Trade Week Poster Contest which was conducted by the San Francisco Junior Chamber of Commerce. Reading from left to right are: Beverly Schmidt, Lowell High School, winner of first prize for $25.00; Angelino Azzolino, Everett Junior High School, 2nd prize for $15.00; Paul Rasmussen, Lowell High School, winner of third prize for $10.00. Standing in back of the winners is R. E. Waterlow, World Trade Week Committee Chairman.

WORLD TRADE POSTER CONTEST WINNERS ANNOUNCED

Three San Francisco students received cash prizes for their winning posters in a World Trade Week Poster Contest held in the city's public and private schools, according to an announcement by R. E. Waterlow, World Trade Week Committee chairman.

Winners of the contest, which was conducted by the San Francisco Junior Chamber of Commerce, were: Beverly Schmidt, Lowell High School, 1st prize; Angelino Azzolino, Everett Junior High School, 2nd prize; and Paul Rasmussen, Lowell High School, 3rd prize.

Prizes of twenty-five, fifteen and ten dollars were given to the winning students at a ceremony May 21, in the San Francisco Chamber of Commerce. Present were the judges: Beniamino Bufano, San Francisco Art Commission; Bruce Bowring, head artist of the San Francisco News; and Alessandro Baccari of the Mona Lisa Art Gallery.

Theme of the contest centered around the importance of world trade in the national economy. The posters were judged on the basis of originality, significance and artistic value.

LONG BEACH, A WORLD TRADE PORT

On the left of Miss World Trade of 1946 and 1947 (Helen Chapman), is Arthur Eldridge, General Manager, Los Angeles Board of Harbor Commissioners and new president of Propeller Club; and on the right, E. J. Amar, Port Manager, Long Beach Board of Harbor Commissioners.

The Board of Harbor Commissioners of the City of Long Beach, California, played host to members of the consular service of many foreign countries and to prominent, interested business and civic men of Southern California at a luncheon May 20, inaugurating World Trade Week.

In the forenoon, E. J. Amar, Port manager of the Long Beach Harbor Commissioners, conducted the guests on a land tour in special buses, of the Long Beach Harbor area and its facilities. The construction now in progress, as well as the projected planned improvements all running into millions of dollars, were pointed out by Mr. Amar, assisted by Chief Engineer, Robert Shoemaker; Assistant Chief Engineer, Charles Vickers and others of the Administrative Staff. Probably in no other harbor at this time is there so much money to be expended immediately for modernizing and enlarging a Port, as is presently in progress or contracted for in the Port of Long Beach.

Immediately after the luncheon, the guests were taken aboard a harbor sight-seeing boat, and taken on tour of the Long Beach Harbor, including the U. S. Navy Shipyard, which is located entirely within the Long Beach Harbor. Thus a splendid opportunity was afforded the members of the foreign consular service and Southland leaders to observe first hand the expansive and efficiently planned harbor which entitles it to the title of "America's Most Modern Port."

Adding color to and evidencing utmost interest in World Trade Week observance at the Port of Long Beach, where the following members of the consular service of many nations, as well as other leaders in business and civic affairs of this area.

Hon. Dr. Julio Alverado, Vice Consul of Panama

Hon. Duke N. Banks, Consul of Bolivia

Fred H. Beeman, president, Foreign Trade Assoc. of So. California

C. S. Beesmeyer, president, Los Angeles Chamber of Commerce

Faye G. Bennison, chairman of Harbor Day Trip

V. E. Duclos, Canadian Government Trade Commissioner

Hon. Dr. Felix B. Janovsky, Consul of Czecho-Slovakia

Hon. Yi Seng Kiang, Consul General of China

Hon. Jorge B. Maroto, Consul General of Costa Rica and President of Latin American Consul Association.

B. O. Miller, vice president, L. A. Chamber of Commerce

Hon. Dr. Mario Profill, Consul of Italy

Gil J. Puyat, president, Chamber of Commerce of the Philippines

Emerson Spear, director, L. A. Chamber, Chairman of Harbor Affairs Committee and Vice President, Pacific Wire Rope Co.

Hon. Eugene P. Tumantzev, Vice Consul of U. S. S. R.

Hon. Dr. Francisco Villagran, Consul General of Mexico

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Hon. Dr. Charles Winsel, Counsul of Belgium and Dean of Los Angeles Consular Corps

Hon. C. A. Gonzales, Consul of Nicaragua

Hon. Ryan A. Grut, Consul of Denmark

Hon. Eugene Huss, Consul of Luxemburg

Harold W. Wright, general manager, L. A. Chamber of Commerce

W. R. Martin, president, Long Beach Board of Harbor Commissioners

John L. Kelly, vice president, Long Beach Board of Harbor Commissioners

Gen. James J. Meade, Long Beach Board of Harbor Commissioners

E. J. Amar, Port manager, Long Beach Board of Harbor Commissioners

Carl B. Wirsching, city manager, City of Long Beach

John H. Mead, president, Long Beach Chamber of Commerce

Arthur Eldridge, general manager, Los Angeles Board of Harbor Commissioners

Bob Sampson, Los Angeles Board of Harbor Commissioners

Howard Woodruff, manager of the Marine Exchange, Los Angeles

Robert Shoemaker, chief engineer, Port of Long Beach, California.

World Trade Week which can be such a vital factor in the creation of a better understanding between peoples of all nations, was given an appropriate and enthusiastic introduction by the Port of Long Beach. Its Board of Harbor Commissioners and staff should be highly commended for their contribution to such an important event.

At top: Adding color to the luncheon which opened World Trade Week, at the Port of Long Beach, are the four pictured here, from left to right—Howard Woodruff, Manager of Marine Exchange, Los Angeles; Miss World Trade of 1946-47 (Helen Chapman); Honorable Yi Seng Kiang, Consul General of China; Honorable Dr. Chas. Winsel, Consul of Belgium, and Dean of the Los Angeles Consular Corps.

Center, left: Enjoying their luncheon in the observance of World Trade Week at the Port of Long Beach, on Tuesday, May 20th, are these dignitaries, left to right—Gil J. Puyat, President, Chamber of Commerce of the Philippines; C. S. (Bob) Sampson, member Los Angeles Harbor Commission.

Center, right: During the luncheon at Long Beach Harbor, Tuesday, May 20th, at the opening of World Trade Week, C. S. Beesmeyer, President of the Los Angeles Chamber of Commerce, speaks through the microphone to the many foreign diplomats and Southland business leaders who met for the observance. John L. Kelly, Vice Chairman of the Long Beach Board of Harbor Commissioners, host to the group, at Mr. Beesmeyer's right, served as master of ceremonies.

Bottom, left to right: Dan Patch, of Patch-Curtis, Long Beach, with "Frosty" Martin, chairman Harbor Board, Port of Long Beach.

Petroleum Imports Exceed Exports, But Export Value Doubles Imports

The San Francisco Regional Office of the Department of Commerce reports that the Nation's petroleum imports outran exports in the first quarter of this year, by volume, but not by value.

Imports totaled 45,230,768 barrels, compared with 35,012,347 barrels exported.

Value of the petroleum products exported, however, ran up to $135,387,752 for the quarter, while imports were valued at $61,461,234.

Merchant Marines May Serve With Navy

Fifty junior officers of the Merchant Marine Reserve will be accepted annually for a 12-month period of active duty at sea aboard Navy combat vessels, under a new officer training plan announced by the Navy. Recent graduates of federal and state maritime academies who have served six months in a licensed capacity in the Merchant Marine and junior officers of the reserve who have not had previous active duty may submit their applications to the Navy Bureau of Personnel through academy superintendents or naval district commandants.

Moran Tugs At Panama, Greece, Azores, Argentina And Way Points

Officials of the Moran Towing & Transportation Co., Inc., announced the departure on May 29 of the 143-foot seagoing tug *Leon* (formerly the ATA 170) for Piraeus, Greece, by way of the Canal Zone, where it will take in tow two 60-ton floating derricks brought down from Seattle, Washington. A third derrick of the same design and construction will be towed to the Azores by one of the Moran deep sea tugs, the *Joseph H. Moran II*, which will get under way from the Canal Zone about the same time as the *Leon*. The tug *Leon* and the three derricks are owned by the Greek Government and are to be used in rebuilding the war-ravaged docks and harbor facilities of Greece.

This is the second such towing operation for foreign interests begun by the Moran Towing & Transportation Co., during May, following the departure May 15 from Pittsburgh of the diesel propelled river tugboat *Victory*, built there by the Dravo Corporation, for the Argentine Government, with two steel barges in tandem tow. Each barge, also built by Dravo, is being carried knocked down for assembly at destination, which is Buenos Aires, Argentina.

The *Victory* negotiated the Ohio and Mississippi Rivers before taking to the open waters at New Orleans. The 95-day trip calls for stops at Kingston, Jamaica; Port of Spain, Trinidad; Georgetown, British Guiana; Belem, Pernambuco and Rio de Janeiro, Brazil; Montevideo, Uruguay; and Buenos Aires, Argentina. As with the *Leon*, Moran is furnishing the crew of 15 which will be returned to New York by plane when the long haul is ended.

The arrangements for the delivery of the 145-foot tug by Moran was made through the Argentine Institute of Trade Promotion on behalf of the Argentine Government.

Pacific WORLD TRADE

1946 Bay Area World Trade Sets All Time Record Volume

The San Francisco Bay Area businessmen rang up 649 millions of dollars worth of trade with foreign countries and U. S. possessions during 1946, figures compiled by the Board of State Harbor Commissioners reveal. This volume of commercial export and import trade set an all-time high for the Bay Area.

The figures re-emphasize the fact that a large part of every income dollar earned in the northern California area is derived directly or indirectly from the activities of the port. The farmer, manufacturer, merchant, railroads, steamships, banks, insurance companies, warehouses, laborer, and the householder are all involved in the movement of these goods.

A tabulation of the leading export and import commodities reveal some rather surprising camparisons.

LEADING EXPORTS, 1946

Meat & meat products	$37,416,207
Milk & cream	32,206,937
Dried fruit	30,099,483
Cigarettes & tobacco	12,427,716
Motor fuel & gasoline	12,335,860
Rice & rice flour	10,999,036
Canned fruit	10,503,636
Cotton manufacturers	9,909,035
Industrial machinery	9,884,531
Canned fish	9,196,251

LEADING IMPORTS, 1946

Sugar	$44,073,555
Coffee	38,547,594
Pineapple, canned or preserved	26,216,932
Pineapple juice	10,324,319
Copra	10,125,988
Tea	6,295,339
Tung oil	5,200,747
Ores, flue dust, mattes	4,174,985
Jute bagging & burlap	3,098,848
Butter & cheese	2,867,282

Revised Prewar Licensing and Certificating Standards

The Commandant, U. S. Coast Guard, Washington, D. C., announced that, effective May 1, 1947, prewar rules and regulations for licensing and certificating of Merchant Marine personnel are resumed.

A 60-day grace period is provided for all persons who, prior to May 1, 1947, are qualified under the regulations then in effect. Applications from such persons will be honored until June 30, 1947, and all actions taken will be in accordance with previous regulations.

The prewar licensing and certificating standards necessarily have been revised to reflect changed conditions in the maritime industry affecting Merchant Marine personnel.

A notice regarding proposed revisions was published in the Federal Register dated September 27, 1946, and a public hearing was held by the Merchant Marine Council on October 22, 1946, at Coast Guard Headquarters, Washington, D. C. All written and oral comments and suggestions submitted by interested representatives of industry were considered by the Council. Where practicable, the comments and suggestions were incorporated as amendments to the prewar regulations. Accordingly, the resultant revisions contain no changes in substantive requirements which were not considered at the public hearing.

The revised standards will be published in a new publication entitled, "Rules and Regulations for Licensing and Certificating of Merchant Marine Personnel." These standards apply to all persons (deck and engine) desiring to be licensed, registered or certificated in order that they may be employed on vessels required by the laws of the United States to carry licensed, registered or certificated personnel. This publication combines in one volume those parts which previously were found in eight other publications dealing with personnel aboard ocean and coastwise vessels, inland vessels, Great Lakes vessels, motorboats, tankers, barges, etc.

For convenience and reference the rules and regulations concerning seaman's allotments, shipping commissioner's functions, manning and similar matters are also included in the new publication.

The new publication will be available without charge at any Marine Inspection Office, U. S. Coast Guard. Due to other printing priorities, availability is not contemplated before September 1, 1947. However, full publication has been made in the Federal Register of March 7, 1947—Title 46, Chapter 1, Volume 12, Page 1549. Copies of the Federal Register may be obtained from the Government Printing Office, Washington, D. C. at a cost of 15 cents per copy.

Shipowners, operators and other persons affected by the navigation and inspection laws and regulations, or persons desirous of making application for a license or certificate are encouraged to familiarize themselves with the contents of the new publication. Toward this end, Coast Guard personnel concerned with the administration of the licensing and certificating laws and regulations will extend every possible assistance.

Coast Guard Closes Foreign Service

OF INTEREST TO MARINE INSURANCE UNDERWRITERS is the announcement of the disestablishment of all Coast Guard Merchant Marine Details in foreign ports.

Two Coast Guard representatives, one each in the Atlantic area and the Pacific area outside the continental United States, will remain in a liaison capacity for facilitating the announced disestablishment. Such representation will be maintained in London, England and Manila, Philippine Islands.

The Merchant Marine Details to be disestablished are located presently in the following ports:

Antwerp, Belgium; Bremerhaven, Germany; London, England; Cardiff, Wales; Le Havre, France; Marseille, France; Naples, Italy; Piraeus, Greece; Shanghia, China; Manila, P. I.; Trieste, Venezia Giulia.

During the war the Coast Guard activated a total of 36 foreign Merchant Marine Details for the purpose of performing "on-the-spot" services in connection with the preventive aspects of safety of life and property of the U. S. Merchant Marine.

In addition to limited vessel inspectional services, shipment and discharge of seamen, and licensing and certificating, the Merchant Marine Details performed related functions of marine casualty investigations, and investigations and hearings of acts of incompetency, misconduct, negligence, unskillfulness, or willful violation of law by licensed and certificated members of the Merchant Marine.

The above functions will now revert to continental U. S. ports in which there are located Coast Guard Marine Inspection offices.

Pacific WORLD TRADE

Marine Insurance

The London Letter

By Our United Kingdom Correspondent

Baltic Ice Damage

THE PROBLEM OF BALTIC ICE DAMAGE has been dealt with by a well-known London marine underwriter—Harold H. Mummery, underwriter of the London Assurance and chairman of the Institute of London Underwriters. Mr. Mummery recently visited Denmark, and addressed a meeting of the Danish Insurance Institute at Copenhagen. He dealt with many of the numerous problems with which the postwar marine insurance world is confronted, but perhaps the most important point which he made was with regard to ice damage.

Denmark, he pointed out, had her ice clause and her system of calculating additional premiums. England had the Baltic Warranty and the scale of additional premiums for condoning breaches of that warranty. How could the two be married? Mr. Mummery said he was afraid that in Britain it was not generally realized that Scandinavian waters in many parts froze nearly to the bottom and caused extensive damage. The best medium by which the various markets could deal with the problem would be to endeavor to frame an international agreement based on experience and simple in application. Any complicated formula would be doomed so far as the British market was concerned. Perhaps it would be wise for British underwriters to review their Baltic scale of additional premiums on the basis of the experience of Scandinavian underwriters and with the advice of those who were so near to the problem.

This is regarded by experts here as a very important pronouncement, and it is considered that more will be heard of the matter in the course of time.

Transitional Phase of Marine Insurance

That marine underwriting is still going through a transitional phase is the opinion of R. Olaf Hambro, Governor of the London Assurance. Pointing out that the year 1946 was not without its difficulties, he states that probably some few years will elapse "before we reach a basis of operations which will be indicative of what we may expect year by year." Discussing the changing situation, Mr. Hambro says:

> "The larger proportion of the marine underwriting account is composed of cargo business, and this has the distinct advantage of a substantial proportion of the liability assumed being more quickly determined than is the case in connection with hull business. This situation is undergoing a change in that there is a larger volume of hull risks available now than has been the case in immediate past years, and arises on account of vessels constructed during the period of the war which were for Government account, and which have now reverted to private ownership. An amount of additional foreign tonnage, too, quite a part of which is of United States construction, is being offered to the London market, a large proportion of this business emanating from the liberated territories.
>
> "The increase in the premium income is accounted for, firstly, by the factor to which I have just made reference, and, secondly, to increased values both as they relate themselves to hull and to cargo interests."

Shipping Losses On Increase

Another authority on marine insurance, Colonel J. G. B. Beazley, chairman of the Reliance Marine Insurance Company, Ltd., of Liverpool, has given some interesting opinions in the course of which he has expressed the view that the foreign hull position is less satisfactory. After remarking that, contrary to expectations, shipping losses had been more numerous in 1946 than in previous years (the gross tonnage totally lost from marine causes in 1946 approximated 469,000, as compared with 311,000 in 1945), Col. Beazley said:

> "Serious partial losses showed the same trend and the annual statistics issued by the Liverpool Underwriters' Association reveal the following features. Almost 50 per cent of the tonnage totally lost was American. 486 fires occurred on shipboard, and 89 of these concerned vessels which were under repair or construction,—29 of them whilst welding appliances were in operation. No fewer than 44 vessels were disabled through loss of their propellers, 39 of them were war-built, all but two in American and Canadian yards. Unfortunately, experience has not improved during the opening months of this year, and the recent loss by fire of the "Monarch of Bermuda," and also the tragic disaster at Texas City, are severe blows to the British marine market."

Pointing out that, in the case of British hulls, there is a market agreement (known as the Joint Hull Understanding), which has kept rates from wild fluctuations, Colonel Beazley continued:

> "The foreign hull position is less satisfactory, and American, Dutch and Scandinavian underwriters complain of London competition, which they contend has reduced terms to an uneconomic level. It is too soon to judge from actual results, but there is every indication that some of our overseas friends were correct, and all responsible underwriters in this country deplore such rate-cutting, particularly as the business can be shared at reasonable terms, in agreement with the markets concerned."

Colonel Beazley dealt, also, with the world-wide curse of theft and pilferage. He commented:

> "As regards cargo insurance, in addition to the heavy list of casualties, we continue to suffer from that war legacy 'moral deterioration,' and claims for theft, pilferage and non-delivery of goods have reached a new high level. In fact, this evil has become a most serious problem both

> at home and overseas. Marine underwriting associations in all parts of the world are collaborating with local authorities in efforts to improve the situation, and our association in this city is investigating the local position with other bodies concerned. It is interesting to see that in Singapore a 'commando' police force is being recruited, which will operate in the harbour area with special powers, and this illustrates the gravity in which the matter is looked upon in that quarter."

Proposed Surcharges

The Dutch insurance market intends holding a conference with British underwriters in the very near future, to discuss the proposed introduction of new surcharges in connection with the transport of goods. The increased surcharges are in consequence of theft, breakage, deterioration, etc. It is proposed to postpone the introduction of the new surcharges until the meeting has been held. From Rotterdam it is reported that the unfavorable situation in the matter of damages has caused changes in the regulations regarding the "Master Cover Import Goods U.S.A." The correspondent comments:

> "Underwriters there try to improve conditions in regard to the theft cover by means of the stipulation that they will only make good 75 per cent of the actual damage. This condition applies to textiles and everything relating to clothing in general, its raw material and tobacco. In case of non-acceptance of this clause by the shipper, the 'basic rate' will be increased by 2 per cent for textiles and three-eighths per cent for tobacco. Furthermore, certain limits have been put to the extension of the cover for full conditions after arrival of the ship and prior to delivery of the goods in receivers' warehouse."

Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

New Statute Permitting Suits Against The United States

DURING THE COURSE OF THE SECOND SESSION of the 79th Congress, the Federal Tort Claims Act was approved and became law on August 2, 1946. Almost everyone knows that the United States of America cannot be sued without first obtaining its permission. The restriction stems from its sovereignty as a nation. Down through the years the United Stated of America, by its own action through the Congress of the United States, has set up certain acts which permit suit against the United States. Each of these acts, however, provides specific requirements which must be met before the suit can be entered in the courts of the United States. A suit can be maintained against the United States in the Court of Claims located in Washington, D. C., and suits can also be instituted against the United States under the Tucker Act in the District Courts of the United States provided that the prayer seeks a recovery of a sum less than $10,000. On the other hand, under the Suits in Admiralty Act, the United States is subject to suit in any District Court of the United States in any amount provided certain factual conditions exist insofar as the issues are concerned. Under the Suits in Admiralty Act, the cause is tried without a jury and before the court alone.

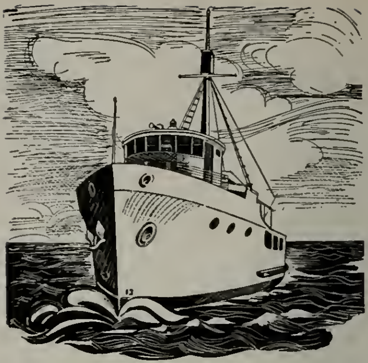
The new Federal Torts Claim Act allows a suit against the United States in any District Court of the United States provided the plaintiff is a resident of the district wherein the act or omission complained of occurred. The Act further provides that the court may determine the issues by benefit of jury. The only other important restrictions that need be mentioned here are that the claims must be for money only and must have accrued on or after January 1, 1945.

Most of us are familiar with the recent controversy between the Dollar Steamship interests and the United States Maritime Commission over the possession of stock certificates covering the ownership of the corporation now known as the American President Lines. The Dollar Steamship Company brought suit against the various members of the Maritime Commission by way of injunction and mandamus, which simply means on one hand to prevent and on the other to require an affirmative act. In the complaint, it was alleged that members of the Maritime Commission were about to sell certain stock held by them in derogation of the Dollar Steamship Company's asserted legal right to the securities. The District Court of the United States for the District of Columbia dismissed the suit with prejudice upon the ground that the suit itself was in fact, although not in name, a suit against the United States of America for which no right had been granted by that sovereign body. The United States Court of Appeals, District of Columbia, reversed the District Court's decision and held that the suit was not one against the United States but was rather a suit against members of the United States Maritime Commission as individuals to prevent them from selling stock which they had in their possession and to require them by court order to return the actual certificates of stock to the Dollar Steamship Company.

The new act requires that the cause of action must have occurred prior to January 1, 1945, which would necessarily limit its applicability to those cases and permit the old rule to apply if the cause of action arose prior to that time, as in the Dollar case. In the Dollar case the lower court attempted to show that the United States was actually the party defendant although unnamed, with the result that the court could find no basis for permitting suit against the United States under the

(Please turn to page 98)

Coast COMMERCIAL CRAFT



STABILITY OF THE TUNA CLIPPER

PART III

By DAVID W. DICKIE

IN THE JANUARY 1947 AND JUNE 1947 issues of the Pacific Marine Review the general plan and procedure of the stability program of the tuna clipper was given.

The data obtained from the procedure of the above mentioned articles is sufficiently comprehensive to establish a basis for determining whether a particular vessel is stable as is, or if not what measures should be taken to remedy the situation.

There is constant pressure from the builders to accept a thorough inclination test made for the first of several vessels built for a set of molds and afterwards they expect the stability work to apply to the succeeding vessels without question.

To illustrate how fallacious this notion is Fig. 4 shows the .m value curves for sister ships that happen to be alike and Fig. 5 shows the .m value curves for sister vessels that were totally unlike.

The .m value is the constant of the formula

$(.m\ B)^2 = GM \times T^2$ where

B = the beam of the vessel

GM = the metacentric height

T = the time for the full roll over and back

The curves are plotted on displacement as a base because the various inclinations are made at different displacements, progressively from the condition of having only the fuel and water aboard, and then adding a pair of wells or a bait box etc., consecutively until the boat is loaded to the point where the deck is even with the water.

That it was imperative to make a stability test of every boat became apparent from the reports of all the sister vessels. The differences between the boats were too great to be ignored but were understandable only to those who understood the calculations. However, it is very seldom possible to get the conditions under which the boats are inclined to be identical and this lack of conformity served as an excuse for argument.

When the .m value curve is plotted, all the essential elements are present and any difference in displacement merely moves the data to a different place on the curve without changing the basic characteristics of it.

The fact that the sister ships of Fig. 4 came so similar was surprising as these two vessels are the only ones of the whole lot that have presented such a close resemblance. Usually there is quite a perceptible difference in the curves. The curve A that is closest to the base line is for the more stable vessel of the two.

The curves of Fig. 5 are interesting because a vigorous protest was made over the waste of time doing the work on the second vessel. That the vessels are not similar in stability characteristics is obvious and what is more important the two curves are entirely different in basic formula.

Vessel C is better than vessel D in the fuel and water condition and much less stable than the other in the final load condition.

Each of the sister ships of Figs. 4 and 5 were inclined by the same man so the difference is not attributable to differences in procedure. The plain fact is that the two vessels of Fig. 5 will be entirely different at sea.

Figure 6 gives the curves for three vessels built from the same molds. It was not surprising when the curves E and F did not agree. Curve G has the same characteristics as curve F but the vessel of curve G is noticeably less stable than the vessel of curve F.

It would have been possible to keep the .m values and the displacements to the same scale throughout all the curves. However, the vessels differ in size and the data for the small vessels would have to be plotted in a limited area at the end of the sheet where the smaller displacements are plotted.

The scale of the curves for the small vessels has been made twice that for the larger vessels for both .m values and displacements so the slope of the curves is comparable from one vessel to the other.

Figure 7 illustrates twin vessels with .m value curves that are curved to the opposite hand.

Figure 8 is the curve for the Pan American the vessel that is being used to illustrate the stability problem.

Up to the moment it has been impossible to determine in advance what the slope of the curve for any vessel will be, for the reason the builders and the fishermen make changes in the design that produce startling results when the vessel is inclined. It can be said in general that where the .m value curves of sister ships show marked differences, it will be found that the vessels trim differently when the same tanks are loaded.

In one case after considerable mathematical effort without an intelligent explanation for the trouble, it was found that the fisherman had not liked the model of the boat when he saw it erected in the yard and had calmly ordered it changed so it was 8″ inside the loft lines in way of the after one-quarter of the vessel's length.

It is quite common for the transverse bulkheads to be moved from 2 inches to 2 feet away from the designed location for which the calculations are made. Also on several occasions an intermediate bulkhead has been introduced dividing a well in half and incidently adding the weight of steel and insulation. On some of the boats the longitudinal bulkheads have been moved outboard reducing the volume of the wells and tanks.

Changes of the above nature result in a change of slope of the curves but notwithstanding the results are sufficiently accurate so the .m value can be used with confidence. The lowest .m value should be used in the formula when a strange vessel is rolled to get the period for the purpose of calculating the approximate metacentric height (GM).

In the June 1947 article the order of procedure for filling the tanks was carefully outlined. If the slope of the curve is expected to conform with a definite pattern that will give the greatest measure of safety it is important that;

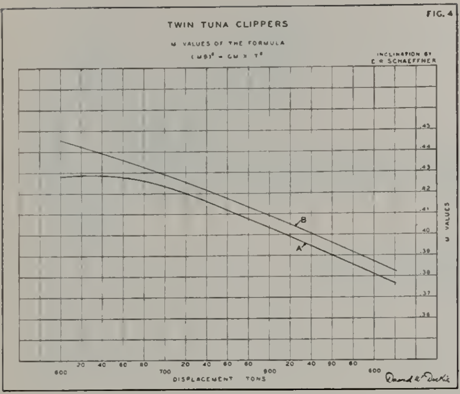
First: One pair of wells in the hold be filled first

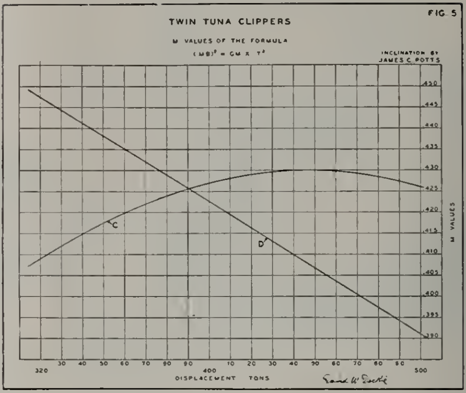
TUNA CLIPPER SUN JASON

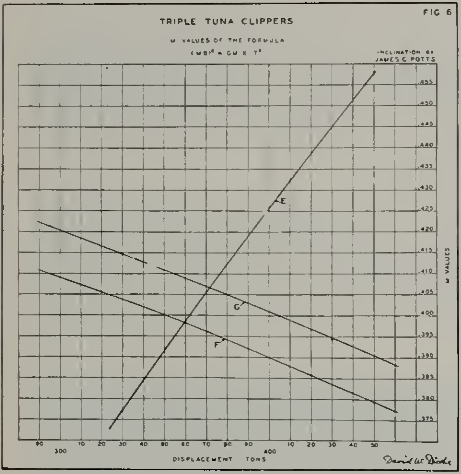
One of the vessels referred to in Mr. Dickie's article.

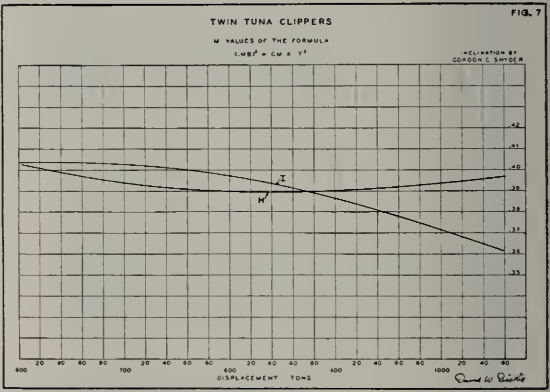
Length	132 ′
Beam	30 ′
Draft	14½′
Gross Tonnage	448

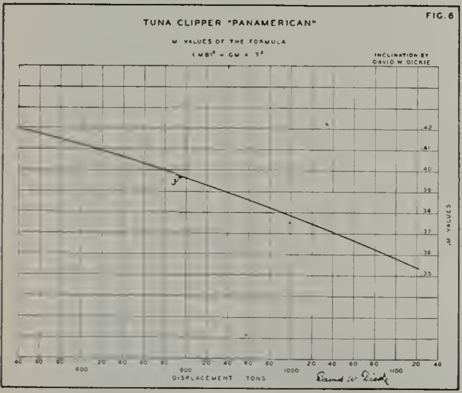
Main engine, Superior Diesel 840 hp, 6 cyl. Auxiliaries, Chicago Pneumatic, two of 187 hp each.











Second: Proceed with filling the bait boxes in order

Third: The other pairs of wells in the hold are filled in order

Fourth: Bait boxes and wells are filled and emptied in order until all the characteristics of the curve are known.

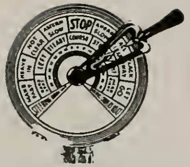
The above procedure insures that the weights that are above the center of gravity of the vessel are put aboard first and all other weights merely modify the condition as they are put aboard in turn. It is not safe to start by filling the bait boxes as many of the boats have insufficient stability to remain upright with the bait boxes filled, without having some weight in the hold.

Where the wells in the hold are filled in order first and the .m value curve is plotted, a distinct change in the curve occurs later when the bait boxes are filled and all of the danger points are not covered.

To get the best results not more than one pair of wells should be filled at any one time and the data taken. Otherwise the spots on the curves are too far apart.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT
COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific
Marine Review, 500 Sansome St., San Francisco, California

THE TIDES

(This is the Second in a Series of Three Articles on the Tides and Currents of the World)

Other Causes of the Tides

IN THE PRECEDING CHAPTER, we confined our discussion of the cause of the tides to the effect of the moon's gravitational force acting upon the waters of the earth. Factors other than the moon, however, enter into our tidal theories and calculations. The sun also has a definite attraction on the earth, and its force combines with the force of the moon to produce our tides. The moon at apogee is about 252,710 miles away from the earth, and at perigee is about 221,463 miles away, while its diameter is about 2,160 miles. The sun is about 26,000,000 times as large as the moon, and therefore it would seem to have a much larger tide producing force. But the sun is about 389 times farther from the earth than the moon, and so, according to calculations involving the law of gravitation, the sun is actually responsible for a much smaller portion than the moon of our total tide producing force. The planets, also, have a tide producing force, but it is so small as to he negligible. Venus, the nearest planet, is 70 times as large as the moon but 100 times farther away, so its force is only about 1/10,000th that of the moon.

Variance in the Heights of Tides

The changing relative positions of the sun and moon, as the moon travels about the earth and both of them go around the sun, produce a great difference in the heights of our various tides.

When the moon is in quadrature, as shown by the solid black moons in Figure 3, our high tides are less than the average. In perigee and quadrature they are about 20 per cent less, while in apogee and quadrature about 40 per cent less.

When the moon is in conjunction or opposition, as shown by the solid black moons in Figure 4, our high tides are higher than the average. In perigee and conjunction or opposition they are about 40 per cent higher, about 20 per cent less, while in apogee and quadrature about 40 per cent less.

Rhythm of the Tides

The tidal day is 24 hours and 50 minutes, while our solar day is 24 hours. As we keep solar time, the tides "retard" an average of 50 minutes per day. Because of the relative positions of the sun and moon, with the sun tide west of the moon tide, occasionally the tides do not retard the full 50 minutes. This shortening of the time interval is called "Priming" of the tides. If because of the relative positions of the sun and moon, the sun tide being east of the moon tide, the tides retard more than 50 minutes, this is called "Lagging" of the tides. The average retardation period is thus deranged, and from a mean value of about 50 minutes may be augmented to as much as 66 minutes or reduced to as little as 38 minutes.

Types of Tides

When the moon is on the equator any given point on earth will suffer the same tidal force from the moon each day, as the point changes from directly under the moon to directly opposite. (Figure 5.)

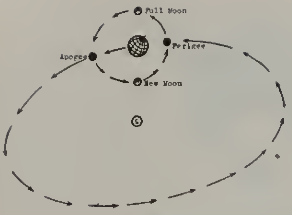
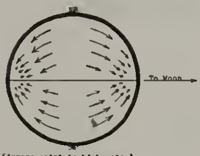


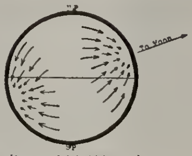
Figure 3.

Figure 4.



(Arrows point to high water)

Figure 5.



(Arrows point to high water)

Figure 6.

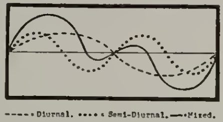


Figure 7.

however, the same point on the earth's surface will be subjected to the same tidal force only once each day. (Figure 6.)

This change in the moon's declination, together with the combined pull of the sun and moon, friction, the great difference in the size and deepness of oceans, and the interfering effects of our great and masses, combine to produce three different types of tides.

(1) Semi-Diurnal Tides are the type found on the Atlantic coast, and coasts of Europe. They have two high and two low waters each day, the two highs being almost equal and the two lows being almost equal.

(2) Diurnal Tides are the types found in the Gulf of Mexico, and certain places in Alaska, the China coast and the Philippines. They have one high and one low water daily.

(3) Mixed Tides are found on the Pacific coast, and on the shores washed by the Pacific waters. They have two highs and two lows daily, but there is considerable diurnal inequality between the two highs and the two lows.

(Continued on page 92)

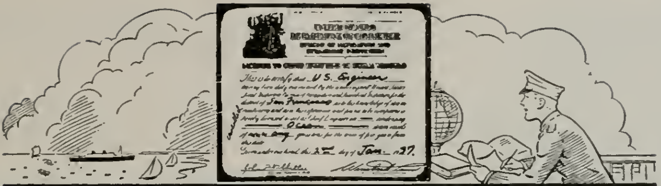
TABLE I

San Francisco (Golden Gate)
JUNE, 1947

DAY	HIGH Time	HIGH Ht.	LOW Time	LOW Ht.
	h. m.	*ft.*	*h. m.*	*ft.*
1	10 47	4.3	4 16	—0.4
Su	21 52	6.0	15 29	2.2
2	11 39	4.3	4 52	—0.7
M	22 22	5.9	16 06	2.6
3	12 28	4.3	5 28	—0.9
Tu	22 50	5.8	16 41	2.9
4	13 18	4.3	6 04	—1.0
W	23 21	5.7	17 17	3.1
5	14 05	4.2	6 39	—0.9
Th	23 50	5.5	17 56	3.2
6	14 52	4.3	7 16	—0.8
F	....	......	18 41	3.3
(7)	0 21	5.3	7 56	—0:6
Sa	(15 39)	(4.3)	19 31	3.4
8	0 58	5.0	8 39	—0.4
Su	16 29	4.4	20 29	3.5
9	1 44	4.7	9 22	—0.2
M	17 12	4.5	21 39	3.3
10	2 41	4.4	10 07	0.1
Tu	17 52	4.6	22 53	3.0
11	3.59	4.0	10 53	0.4
W	18 25	4.8	....	......
12	5 32	3.8	0 04	2.5
Th	18 57	5.1	11 41	0.8
13	6 58	3.7	1 06	1.8
F	19 27	5.4	12 27	1.2
14	8 10	3.8	1 56	0.9
Sa	19 57	5.8	13 14	1.6
15	9 18	3.9	2 45	0.1
Su	20 31	6.1	114 01	2.0

TABLE II
TIDAL DIFFERENCES AND CONSTANTS

California	Latitude	Longitude	Tidal difference Time of tide	Tidal difference Height of high water	Ratio of ranges	High water interval	Mean range of tide	Diurnal range of tide
	° ′	° ′	*h. m.*	*feet*		*h. m.*	*feet*	*feet*
CALIFORNIA, *Outer Coast*—Continued	*North*	*West*	*Time meridian, 120° W.*					
	Reference station, **San Francisco**							
Monterey, Monterey Bay	36 36	121 54	—1 05	—0.5	0.9	10 26	3.5	5.3
Santa Cruz, Monterey Bay	36 58	122 01	—1 10	—0.5	0.9	10 23	3.5	5.3
Ano Nuevo Island	37 06	122 20	—1 20	....	0.9	10 13	3.5	5.2
Princeton, Halfmoon Bay	37 30	122 29	—1 05	—0.2	1.0	10 30	3.8	5.5
Southeast Farallon Island	37 42	123 00	—0 45	—0.3	0.9	10 40	3.6	5.4
San Francisco Bar	37 46	122 38	—0 40	—0.1	1.0	11 00	3.8	5.6
Point Lobos	37 47	122 31	—0 40	+0.1	1.0	11 00	4.0	5.9
San Francisco Bay, South Portion								
Bonita Cove, Golden Gate	37 49	122 32	—0 15	+0.1	1.0	11 16	4.0	5.8
San Francisco (Golden Gate)	37 48	122 27	....	....	....	11 40	3.9	5.7
Alcatraz Island	37 50	122 25	+0 10	+0.1	1.0	11 50	4.0	5.8
San Francisco, North Point	37 49	122 25	+0 20	+0.1	1.0	11 55	4.0	5.8
San Francisco, Mission Street	37 48	122 23	+0 30	+0.3	1.1	12 07	4.2	6.0
Yerba Buena Island	37 49	122 22	+0 30	+0.3	1.1	12 03	4.3	6.0
Oakland Pier	37 48	122 20	+0 35	+0.3	1.1	12 10	4.3	6.0
(Alameda)	37 46	122 18	(+0 40)	(+0.7)	1.2	12 16	4.7	6.4
Oakland Hbr., Grove Street	37 48	122 17	+0 35	+0.5	1.2	12 10	4.5	6.2
Oakland Hbr., Park Street Bridge	37 46	122 14	+0 40	+0.6	1.2	12 21	4.6	6.3
Bay Farm Island Bridge	37 45	122 14	+0 45	+0.8	1.2	12 22	4.8	6.5
Oakland Airport	37 44	122 12	+0 40	+0.8	1.2	12 21	4.8	6.5
Potrero Point	37 46	122 23	+0 35	+0.6	1.2	12 09	4.5	6.3
Point Avisadero, Hunters Point	37 44	122 21	+0 40	+1.0	1.3	12 10	4.9	6.7
Roberts Landing, 1⅓ miles west from	37 40	122 12	+1 05	+1.5	1.4	0 04	5.4	7.2
Point San Bruno	37 39	122 23	+0 55	+1.2	1.3	12 23	5.1	6.9
San Mateo-Haywards Bridge	37 35	122 15	+1 05	+1.7	1.4	0 04	5.6	7.4
Coyote Hill Slough entrance	37 34	122 08	+1 10	+2.1	1.5	0 10	6.0	7.8
Redwood Creek entrance (inside)	37 31	122 12	+1 15	+2.2	1.6	0 18	6.1	7.9
Smith Slough	37 30	122 14	+1 30	+2.2	1.6	0 27	6.1	7.9
Dumbarton Highway Bridge	37 30	122 07	+1 15	+2.6	1.7	0 14	6.5	8.3
Palo Alto Yacht Hbr., Mayfield Slough	37 27	122 06	+1 35	+2.7	1.7	0 24	6.6	8.4
Calaveras Point, west from	37 28	122 04	+1 20	+2.9	1.7	0 18	6.8	8.5
Mud Slough Drawbridge	37 28	121 58	+1 25	+3.6	1.9	0 22	7.4	9.4
Alviso (bridge), Alviso Slough	37 26	121 59	+1 55	+3.3	1.8	0 47	7.1	8.9



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

AWP — (Allowable Working Pressure)

SOME TIME DURING THE CAREER of every chief engineer he has been required to find the allowable working pressure AWP of a pressure vessel. The formula for calculating this is given in the Marine Engineering and Material Specifications issued by the United States Coast Guard. It is the purpose of this series to show the reasoning, logic and mathematics behind the formula given in these regulations. Mathematics is the short-hand expression of logical reasoning. There are two kinds of formula, the *pure* and the *empirical,* or simply the absolutely correct and the practically correct. Much of the mathematics in engineering is of the empirical type. This means that many factors, specific figures, constants, and allowance ratios (safety factors) are used in the formula.

The AWP or simply the W for boilers formula is an example of the empirical mathematics. Study these black board sketches. Before introducing the safety factor and efficiency of the riveted joint the formula is pure. But it is not practical to operate at a stress which nearly ruptures the steel. We cannot be so sure that the stress per square inch used is exactly right. We find 55,000 stamped on a corner of the steel plate. Perhaps it is only 48,000 at one point due to differential heat treatment. We must allow for reduction of thickness with time, corrosion and abuse. The formula becomes empirical

Fig. 1

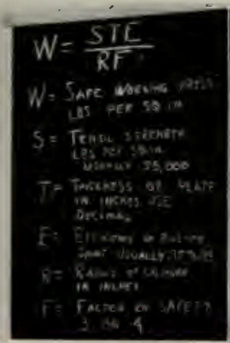


Fig. 2

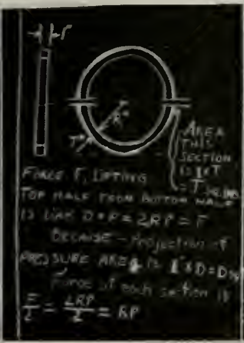


Fig. 3

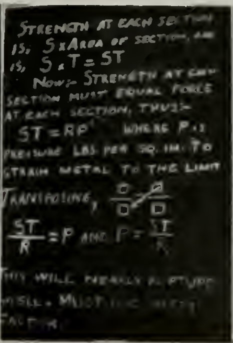
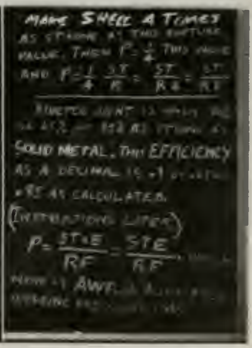


Fig. 4



when we use the safety factor given in the regulations. (See P 66 in the 1944 edition.) Use 4 if not exposed to products of combustion and 4:25, 5.0, 6.0 and even 10.0 or 12.0 for different kinds of construction.

It should be clear why we take a circular section of the drum exactly one inch long. It is because any inch along the longitudinal section is the same as any other inch and we need study only one of them. It may not be quite so easy to see why we conclude that the force on the two ends of the section in the black board sketch is the pressure times the diameter times the one inch length of section. It seems reasonable that since the pressure is on the circumference of the section we should use the length of this circumference or $\frac{1}{2}\pi$ D instead of just D. But notice that the several square inches of this circumference each contribute a different value of force at the ends of the section. For instance the two square inches, one at each end of the section, are faced at nearly right angles to the force we are interested in. These two units are facing each other and therefore they counteract each other and contribute nearly nothing to the force being studied. The square inch at the top of the section delivers its load nearly 100 per cent to the force being studied. Of course, we could calculate each square inch and the amount of its load delivered to the force studied and add them all up. But there is a very much simpler line of reasoning to use.

We know from experience and logic that any closed vessel with pressure on the inside has no tendency to move. There is no force in it except gravity. If we take the upper half section and enclose it with a flat straight piece at the diameter and put pressure in it, we must conclude that there is as much force or load in a downward direction on this diameter as there is in an upward direction on the circumferential part even though the curved part is $\frac{1}{2}\pi$ longer than the diameter. These forces being equal we conclude that we can use the diameter in figuring the force at the ends of the section.

The radius R of the drum or cylinder is taken as the inside measurement. Where the thickness of the shell is over 1/10 or 10 per cent of the radius an empirical adjustment is put into the formula to allow for lack of equal sharing of the load between elements of steel near the inside and those near the outside.

The efficiency of the riveted joint will be covered in the next article.

Book Review

COLLISION PREVENTION by Davis Newton Lott, Commander, USNR, published by D. Van Nostrand Company, Inc., New York, net price $5.00.

This new nautical text presents clearly and concisely, with many good illustrations, the results of over three years' research by the author on the cause and prevention of collision at sea.

As the author states, "It is the purpose of this book to present a scientific method of avoiding ship collisions through a systematic analysis of tactical data and their relationship to the various collision situations. The material set forth is so designed that it will serve as a ready reference and guide for any person responsible for the safe navigation of a ship at sea: all ship's officers whether Navy, Coast Guard, or Merchant Marine, and the many individuals who pilot private vessels. In addition, the text constitutes an essential requisite in any student's training for a career at sea."

Included are all the fundamental principles of collision avoidance based upon the use of a new term: Collision Angle. Then too, this volume contains all of the Rules of the Road, both International and Inland, as well as all Pilot Rules currently in force. There is a chapter on wartime collisions, well illustrated with diagrams.

Already used throughout the Navy's Emergency Shiphandling schools, and recently included as part of the Seamanship course at Annapolis, Commander Lott's new principles of collision prevention have been reviewed and approved by the Coast Guard and the Merchant Marine Academy at King's Point.

Recent Books on Small Boats

GUIDE TO BOAT HANDLING by R. J. Hooper, published by James Ladd Delkin. Price $2.00.

This book is slightly different from most on the subject as a considerable amount of general information and theory has been eliminated—purposely; and only the essentials of boat handling are covered. This GUIDE is in outline style, and very handy for quick reference.

* * *

POWER FOR THE SMALL BOAT by W. Melvin Crook, published by Dodd, Mead & Company, New York. Price $3.00.

This book is written particularly for the individual who owns (or dreams of owning) an inboard-engined boat, and who does not employ a professional crew.

The subject matter is simply arranged for the convenience of the small boat owner, regardless of the intensity of mechanical interest. What engine should you select? What simple requirements are to be noted in installing it? What are the essentials of owner maintenance? What of laying up and restoring the craft?—these subjects are covered accurately and vividly by an expert who has spent years tinkering with racing and designing marine engines.

More than 60 drawings and charts are included.

On the Ways

New Construction - Reconditioning - Repairs

▲ **TODD RECONVERTS UNITED FRUIT LINER**

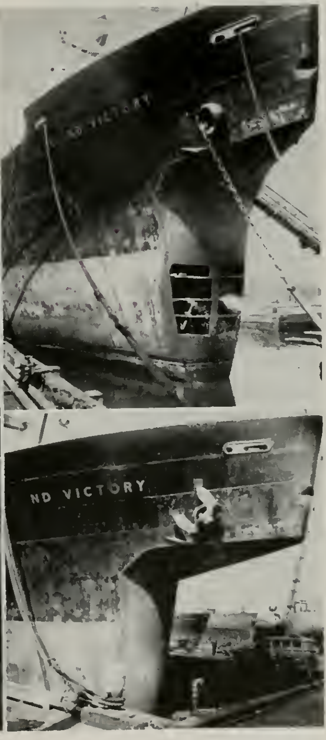
Reconverted after war service, at Todd Shipyards Corporation's Brooklyn division, the Antigua of the United Fruit Company's "Great White Fleet" is ready again to sail the Caribbees in regular cargo-passenger service.

▲ **THE SEA SATYR**

This fine picture of the C-3 Sea Satyr was taken as major repairs neared completion in Bethlehem's San Francisco yard. The Sea Satyr has been purchased by American Mail for the Orient run and Engineer Frank W. Smith is supervising the work for the owners. In the picture Naco anchor chains gracefully frame the bow.

PLASTIC SURGERY ▶

At Todd Shipyards Corporation plastic surgery is being performed to the vessels shown here. At right, top and bottom: The Liberty ship, David B. Johnson, received a complete new bottom at the Todd Hoboken Division yard, after she went aground off the East coast of Florida in early April. The burners cut away at the badly bent and battered plates; while below, a Todd Inspector is checking on the extent of damage to the bottom. At extreme right, top and bottom: The Blue Island Victory, which had a big chunk taken out of her bow in an accident in the North Sea several months ago, is shown getting patched up at the Todd Brooklyn Division, after emergency repairs were made on the vessel at Bremen, Germany.



Weighing 333,250 pounds, these six propellers and seven tailshafts represent the largest single shipments of that type ever made to a foreign nation.

Record Propeller and Tailshaft Order Shipped to Netherlands Government

ONE OF THE LARGEST SINGLE SHIPMENTS of ship propellers and tailshafts for a foreign government was made by Bethlehem Steel Company's Staten Island Yard.

The shipment comprised three propellers and three tailshafts for Liberty ships and three propellers and four tailshafts for Victory ships. Weighing 333,250 pounds, the "wheels" and shafts are consigned to the Netherlands Ministry of Traffic.

For use as spares on vessels purchased from the United States, the equipment will be transported to the Ministry by the Holland-American Line Steamship Moolengraaff, now loading at Hoboken. The Pontin Lighterage and Transportation Corporation handled the shipment between the yard at Mariners Harbor and the Moolengraaff's loading berth.

All of the propellers were cast, machined and completed at the Bethlehem Staten Island Yard's foundry and propeller shops. The Liberty ship "wheels" weigh 20,500 pounds each and have a diameter of 18 feet 6 inches, while the Victory ship propellers weight 40,000 pounds each, with a diameter of 20 feet 6 inches.

Forgings for all of the tailshafts came from the Bethlehem plant in Steelton, Pa., and the centrifugally cast bronze liners all came from the Bethlehem, Pa. plant. The Liberty ship tailshafts, weighing 13,050 pounds each and 18 feet 3 inches long with a diameter of approximately 17 inches, were machined and completed at the Staten Island Yard. The Victory ship tailshafts, weighing 28,150 pounds and 19 feet 6 inches long with a diameter of about 23¼ inches, were machined at the Bethlehem Quincy Yard.

Smith-Rice Opens at Los Angeles

Smith-Rice Company have announced the opening of offices in San Pedro, at Berth 82. The company which has for so many years served the shipping industry in the San Francisco Bay area is now operating in Los Angeles Harbor. Three new derrick barges are in operation in the harbor. Los Angeles operations of the company are under the management of L. P. Kelly who now resides in San Pedro. Mr. Kelly was connected with the Smith-Rice organization in San Francisco for many years and moved to the Los Angeles area about a year ago. The Smith-Rice Company has been working for the Sanitation District of Los Angeles County on the White's Point sewer outfall project since the underwater part of the project was commenced about a year ago.

The Smith-Rice Company derrick barges are probably capable of handling the heaviest lifts that will come into the harbor.

One very interesting feature of the Smith-Rice barges is their ability to reach over a ship and pick cargo from cars, trucks or docks without changing position. This saves considerable time for operators and agents, as has been proven in the bay area where Smith-Rice Co. has been using "over ship" derrick barges for some time.

Photograph shows Smith-Rice derrick barge in Los Angeles harbor reaching over the MS Dagmar Salen and "picking" a lift from a gondola car. The ship's rail to water is 33 feet.

Running Lights

Edited by B. H. BOYNTON

THE PRESENT STATUS OF THE SEA-AIR ISSUE

By PAUL HODGES

Public Relations Director, Matson Navigation Company

(Editor's note—Because the continuing Sea-Air Controversy is so vital to American shipping and because Mr. Hodges is a top expert on the subject, his views are certain to arouse a wide interest among our readers.)

Paul Hodges, director of Public Relations for Matson Line, who addressed the Propeller Club in San Francisco on the Sea-Air issue.

MOST OF YOU ARE FAMILIAR WITH THE ELEMENTS of the Sea-Air Issue. Ten of the major steamship companies of the United States which operate passenger services have banded together in the Sea-Air Committee of the National Federation of American Shipping to establish a *principle*—to establish it by *legislation,* by *administrative* action, or by *whatever* legal and proper means is required to get it established. The immediate application of this principle is of interest chiefly to these operators of passenger services. The long range implications are of vital concern to everyone in the shipping industry, and further, to every citizen and business man who believe in equity, fair play and equal opportunity.

The immediate issue is simply this:

Shall an established transportation company, simply because it operates steamships, be forever barred from using air equipment in serving its regular customers over its regular routes, while the *exclusive* use of that equipment is vested in a small group of favored companies which have only *recently* evidenced any interest in those customers or routes?

Or shall steamship companies, like each of these favored companies, be accorded equal treatment by the appropriate regulatory agency and a fair chance to show that, on a given route, they can serve the public convenience and necessity better than other applicants?

That's all there is to this issue of Sea-Air. It is a plea for an equal and fair break—no more, no less. No special privileges are asked. No preferred treatment is sought. It is simply a request that steamship companies be permitted to come into court on equal footing with others—that they be *not* judged in advance, and thrown out of the courtroom because they have committed the heinous crime of having operated successful transportation services by steamship.

Now, that is the immediate issue, presently affecting only a relatively few companies, although these are most of the principal American-flag operators of steamship passenger services. There is a larger issue, or several larger issues, wrapped up in Sea-Air, which apply indirectly to everyone who does business or who has a stake in free enterprise.

This is the question of whether we are to see imbedded, as basic philosophy in the field of government regulation, the proposition that everyone of us must perforce stick to his last; that once certain tools are used in a profession or occupation, new and more modern tools may not be used by that profession or occupation; that private enterprise shall not be permitted to grow and flourish and progress with the times and modern technology.

If the restrictive theories of certain members of the Civil Aeronautics Board had been in force earlier in this century, Henry Ford would never have been permitted to build an automobile. The Wright Brothers would not have been permitted to build airplanes. Why? Because both were experts on the bicycle—they repaired and built them. Once a bicycle maker, always a bicycle maker. If bicycles opened a big market in motorcycles, throw out the bicycle chap, and bring in a new crowd, because

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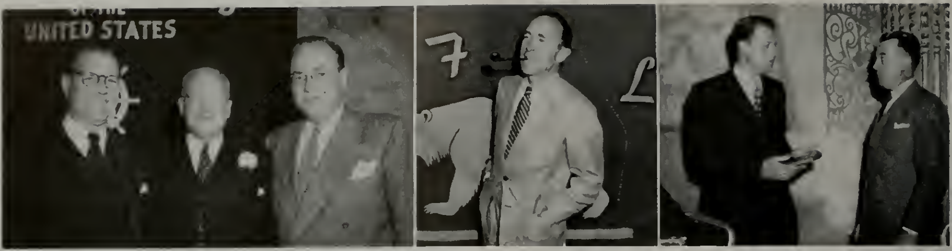
* From an address before the San Francisco Propeller Club, June 18, 1947.



PROPELLER CLUB AWARDS

Pacific Coast newsmen were awarded news writing honors in a recent contest for newsmen, feature writers and photographers during 1946. The awards were announced at the opening of the National Marine Exposition in San Francisco, sponsored by the Propeller Club of the United States.

At the June meeting of the S. F. Propeller Club checks were presented to the winners. Above left: Jeff Wilson, marine editor of the San Francisco Commercial Daily News, who won 3rd award as feature writer; Club President W. Miller Laughton; and Richard M. MacFarlane, marine editor of the S. F. News, who won first award for feature writers. In the center: Long Beach Press-Telegram's Marine Editor Edsel Newton stood first in nation as a maritime news writer in the nationwide contest. The award carries a $250 cash prize and a trip to New York during the annual Propeller Club convention and the National Merchant Marine Conference next October. At right: Robert E. Mayer of Pacific-American Steamship Association, presents plaque to John R. Wagner of Pacific Far East Lines for this company's winning float in the Maritime Day parade.

the bicycle utilizes *leg muscles* while the motorcycle utilizes a *gas motor.*

Or take another analogy. The carpenter becomes proficient in the use of hand tools. Electrically-driven tools become available. In conjunction with the hand tools they would greatly improve his efficiency. A government agency says to him: "You can't have any of the newer tools. We'll bring in some new people, give them the new tools, pay them while they learn how to operate them, and send them into your territory."

Every man can make the application to his own field.

It should be noted here that the Sea-Air restrictions are almost unique in the field of government regulation. The Civil Aeronautics Board's attitude toward steamship companies has no echo within other federal transportation regulatory agencies. Limitations, safeguards, yes; prohibitions, no. Despite efforts to persuade the public to the contrary, it is interesting to note that the railroads of the United States operate more route miles of motor vehicles than anyone else; that railroads have operated and still may operate steamships; that, as a matter of ironic fact, there never has been any restriction placed so far as I am aware upon the right of airlines to own and operate steamships, busses, trucks, railroads or kiddy-cars if they choose.

The semantics experts have a phrase to sum this all up. The phrase is "Form Segregation." The avocates of form segregation hold that each mode of transportation should be bottled up in water-tight compartments, each forced to rise or fall upon the basis of the relative efficiency or public acceptance of a particular type of vehicle. This group—and its number is small— holds that the vehicle is both the end and the means. The opposing philosophy is that efficient, cheap transportation is the end and that the vehicle is the means of attaining the end. This latter philosophy is the philosophy of the various Transportation Acts passed by Congress, it is the implied expression of the United States Supreme Court.

The Civil Aeronautics Act was passed in 1938. Prior to that time overseas aviation was still very much in its infancy. Adequate equipment for the long overseas flights was still unavailable. Several steamship companies with a long eye to the future and a progressive spirit had long been studying and planning for air services over their routes. It apparently never occurred to any of them that a board of five men would take the position that steamship companies should never be permitted to use aircraft—save under such rigid limitations as amount to a prohibition. The congressional debates prior

(Please turn to page 104)

PORTLAND PROPELLERS

Scene at a recent banquet of the Port of Portland, Oregon, Propeller Club of the United States. Left to right: Rev. Fogarty, who gave a brief talk; Mr. Hazen, president of the Shipping Club; L. S. Baier, chairman of the Maritime Day Committee; Kit Conyers, master of ceremonies; Colonel O. E. Walsh, district engineer and principal speaker; Captain McGarity, port coordinator, and C. E. Collins, president of the Portland Propeller Club.

THE NEW CIVILIAN NAVAL RESERVE

The people of America promised peace to the world. For us now to keep our pledge we must have a force for peace. The new civilian Naval Reserve will become such a force when its ranks are filled with men who, by joining, show that they will actively insure that peace is made and kept.

There are real advantages of becoming a member of this organization which commands respect and admiration throughout the country. In large communities there are, or are being planned, Naval Reserve Training Centers. Many of these centers are equipped with the devices of a modern Navy—radar, sonar, radio and electronics. There are carpenter and machine shops, models of Naval equipment, and operating mockups of intricate machinery which permit members to learn by practical work. In addition, many of these centers can be used for recreation. There may be libraries, lounges, space for dances, and for athletics, pistol and rifle ranges.

Ships and submarines are assigned to Naval Reserve Centers so that members may learn how the Navy does it by actually going aboard. These ships are also used for short cruises in local waters for experience in navigation, seamanship, and many phases of actual shipboard operation.

For the Naval Air Reserve first line planes are available at Navy Air Reserve Training Stations so that members may improve their skill as pilots, air crewmen, and in maintenance and upkeep of aircraft.

Those Eligible in Naval Reserve

Navy, Coast Guard and Marine Corps veterans of World War II of any age who served honorably for more than six months.

Veterans of any other U. S. military service and non-veterans between the ages of 17-39 inclusive.

For those who qualify and desire it, there are periodic two-week cruises, with pay, either: in the Navy's best ships; for Naval Air Reserves on carriers or at Naval Air Stations; for specialists at Navy Shore Stations.

The new, Civilian Naval Reserve is not a weapon for future war—it is a power for peace, a restraining hand on warmongers anywhere. But Americans should not forget the warning of George Washington:

"It is better to have the guns and not need them, than to need the guns and not have them."

At top: Roy A. Drury, 18, of Millbrae, is congratulated by Captain Daniel N. Cone, USN, District Director of Naval Reserve, on being the first teen-age enlistee in the San Francisco Organized Submarine Reserve.

Center: Frederick Cutter, newly sworn in as the first 17-year-old non-veteran to join the Naval Reserve in Oakland, California, gets his first lesson from Chief Boatswain's Mate F. C. Town of Richmond, California, one of the Naval Reserve instructors at the Oakland armory.

At right: Another member of the Cutter family joined the Navy recently when Frederick Cutter, 17, was sworn into the Naval Reserve as the first non-veteran to join in the East Bay area. He is shown above with other Navy members of his family: (left to right) F. W. Cutter, Chief Quartermaster USN (Ret.), uncle; Commander P. T. Quarry, Medical Corps, USNR, uncle from Santa Rosa; R. C. Cutter, Chief Yeoman, USNR, father, Frederick Cutter, and Captain D. N. Cone, director of Naval Reserve, Twelfth Naval District, who administered the oath of allegiance.

U. S. Navy Photographs

Brig. Gen. Neal H. McKay, in command of the San Francisco Port of Embarkation.

PORT OF EMBARKATION ACTIVITIES EXPLAINED AT MARINERS MEETING

Brigadier General N. H. McKay, commanding general, San Francisco Port of Embarkation was the feature speaker at the May meeting of the Mariners Club of California at San Francisco. His very interesting subject dealt with the "Operation of San Francisco Port of Embarkation." As commanding general, SFPE, he has directed the changeover of the Army port from wartime to peacetime status, and in such an interesting assignment his remarks on the San Francisco Port were enlightening to the Mariners members gathered at the El Jardin Restaurant.

This Port is one of four in the United States operated by the Transportation Corps, under the War Department. The others are New York, New Orleans, Seattle. These are military facilities of the War Department and are operated by military men with the co-operation and most valuable assistance of the commercial shipping industry.

During the calendar year 1946, the San Francisco Port of Embarkation handled 2,800,000 measurement tons of cargo. Through this Port passed 800,000 passengers, troops, officers, civilian employees and dependents of military personnel.

Of the large tonnage handled through this Army Port, more than 85 per cent was lifted in commercial bottoms, handled by commercial stevedores and by commercial shipping operations under cargo charter party arrangements, space charter, time charter, or voyage charter contracts. On this basis the operations of the Transportation Corps are an important factor in the economy of this country and this San Francisco Port of Embarkation *is an integral part of the commercial shipping industry of this Port and this community.*

At the present time practically all the troop and passenger lift is in United States Army Transports. This is the home port of 32 Army ocean-going passenger and cargo ships. The primarily passenger ships are eight of the P-2 type, twelve C-4 transports, and three of the C-3 ships, the Republic, and three hospital ships. The Army has five victory cargo ships. All these vessels are manned by civilian crews. Most of the licensed crew members are old timers in the Pacific and in the Army transport service. These and the others employed are from San Francisco marine population, people whose families live here and who consider San Francisco their home.

The Army has three large facilities: Fort Mason, Camp Stoneman and Oakland Army Base. Fort Mason contains the Port Headquarters and also serves as the marine passenger terminal. Oakland Army Base is the cargo terminal, where Army supplies and equipment are assembled, loaded and dispatched to the many military bases in the Pacific. Camp Stoneman is the Port Personnel Center. It contains an Oversea Replacement Depot, a staging area, a reassignment point and a separation center. All military personnel passing through the Port either outbound or inbound are processed at Camp Stoneman.

Brig. General McKay, native of Texas, entered the Army during World War I and was commissioned a second lieutenant nine months later. He was commissioned in Regular Army in 1920 and in service ever since, principally in Quartermaster Corps work. He is a graduate of Quartermaster School, Army Industrial College. He has seen service in the United States, Hawaii, the Philippines and Panama.

World War II saw him in the Mediterranean Area as Deputy Chief of Staff for Services of Supply, North Africa Theater; Chief of Staff of this campaign; deputy assistant chief of staff, G-4 at Allied Force Headquarters, Italy; Director of Supply, Headquarters, ASF, Washington; and June, 1946, Commanding General, San Francisco Port of Embarkation.

For his work in the Mediterranean he has been awarded the Distinguished Service Medal and the Legion of Merit.

The Women's Organization for the American Merchant Marine June 1947 meeting, held at the Army-Navy Club in San Francisco, had as guest speaker, Chaplain Ragnar Kjeldahl, program secretary for Merchant Seamen of the Embarcadero Branch of the Y.M.C.A., who gave an informal talk with regard to the Club's cooperation in supporting his work for the merchant seamen. Left to right: Mrs. Irving La Fortune, Mrs. Henry Dibble, newly elected president of San Francisco City and County Federation of Women's Clubs; Mrs. Harry W. Parsons, retiring president of the Women's Organization; Chaplain Kjeldahl; Mrs. John F. Johnston, new president of the Women's Organization, and Mrs. Frank Short, a past president.

MARINE PICTORIAL REVIEW

VISITS COAST

A recent visitor to the West Coast was H. C. "Curt" Gamlen, vice president of the Gamlen Chemical Company, here from their offices in Pittsburgh, Pa. While in San Francisco, Curt ran tests of some of the more recent Gamlen discoveries, along with his father, Harry Gamlen (left) and R. A. Gamlen (right). Harry Gamlen, founder and president, is still the Company's most active chemist, specializing in the problems of marine engineers.

▲

George L. Crow, Pacific District Manager of General Electric's Federal & Marine Section, explains a few details of a G-E marine auxiliary turbine to Virginia Phillips who was San Francisco's Maritime Day Queen. Miss Phillips visited the General Electric exhibit at the Marine Industry Exhibit held at the San Francisco Marine Exchange from May 19th to 23rd.

►

GRACE OFFICIALS ON NEW JOHNSON LINER

This picture was taken during a gracious reception aboard the Johnson Line's Paraguay on her first visit to the Pacific Coast. There will be a descriptive story on the Paraguay in the August Pacific Marine Review.
Left to right: D. N. Lillevand, Fred L. Doelker, Captain S. Lagerberg, Captaiin Oscar Gedda, master of the Paraguay, and R. E. Pyke.

▲
R. L. Minckler, executive vice president of General Petroleum Corp.

YOUNG IRON WORKS APPOINTS A. K. LOWE PURCHASING AGENT
The appointment of A. K. Lowe to the position of purchasing agent has been announced by Young Iron Works, Seattle, manufacturers of tools and equipment for the marine, logging, contracting and mining industries.
▼

R. L. Minckler's New Appointment

The board of directors of General Petroleum Corporation has elected R. L. Minckler executive vice president, it is announced by S. J. Dickey, president.

Additional honors came to Mr. Minckler recently when he was one of three western oil men appointed by Secretary of the Interior Krug to the government's new 15-man Military Petroleum Advisory Committee, whose function is to advise the Army and Navy of Petroleum matters.

Joining General Petroleum in 1924, ten years later he became assistant to the president, and in 1941 was elected a director. He was for several years a director of the Kettleman North Dome Association.

During World War II, Mr. Minckler again served the government, as Director of Petroleum Supply of the Petroleum Administration for War, with headquarters at Washington, D. C. Upon returning to General Petroleum in 1945, he was elected a vice president of the company.

Promotions

Three major promotions have been announced by the General Petroleum Corporation. J. W. Templeton becomes assistant to the Director of Production; W. C. Lynch is advanced to assistant to the Manager of Industrial Relations and W. D. Joiner, Jr. replaces Mr. Lynch as manager of the Personnel Department.

Templeton, a Stanford alumnus and, like his brother, the famous "Dink" Templeton, a former Stanford athlete, has been with General Petroleum more than 26 years, his entire business career having been spent with the company in various engineering capacies.

Lynch is a 31-year G. P. veteran and has headed the personnel department since 1929. Like Mr. Templeton, he hails from Stanford. Currently, Mr. Lynch is "Kingfish" of the company's 20-Year-Club, which is composed of hundreds of men who have been with G. P. for that length of time.

Joiner entered the company's service in 1925 and, for the past ten years, has been assistant to the manager of production. A native San Franciscan, he attended the University of California.

Stiefler Tells the World

"F. A. W. Stiefler, publicity representative for Bethlehem Steel Company in Southern California, announces the completion of the current expansion program in the Stiefler household with the arrival of Walter A. Stiefler.

Young Stiefler arrived on 3 June in accordance with the anticipated project completion date. The increase weighed 7 pounds, 13 ounces. It is reported no delays were entailed due either to material shortages or labor disputes. No further expansion is planned for 1947."

Captain Pearch Advanced

The duties of Captain Walter G. Pearch, veteran marine superintendent for American President Lines in San Francisco, have been expanded to include the position of Assistant Operating Manager, effective July 1. His new assignment as Assistant Operating Manager fills the vacancy left by the recent death of Captain Carl W. Hawkins.

Born in Liverpool, England, in 1891, Captain Pearch started his long sea-going career in 1906 as an apprentice on English sailing ships. In 1922 he joined the Dollar Line as a chief mate and in 1923 he became a Master.

Two years later Captain Pearch came ashore to become Assistant Port Captain in San Francisco. In 1928, he was made Port Captain, and in 1942 was promoted to Marine Superintendent.

Captain Walter G. Pearch, marine superintendent for American President Lines in San Francisco.
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Recent visitor among his San Francisco friends was Colin Davies, consultant engineer & marine surveyor at Redondo Beach, California.

Thomas A. Short Co. Represents Oxi

The Thomas A. Short Company, 245 Fremont Street, San Francisco, has been appointed distributor in this territory for the Oxi Corporation of Gary, Indiana.

The Oxi Corporation are manufacturers of Oxi crystals for cleaning the fire side of steam boilers and furnaces of soot, slag, firescale and external scale.

Lawrence Wolff Thirty-Five Years With Union Oil

Lawrence Wolff, manager of Refinery Sales, recently rounded out 35 years service with Union Oil Company of California. "Larry" Wolff, an Oakland boy, joined the company at the age of 16 back in 1912 as office boy in the San Francisco office. In 1921 he was transferred to the Head Office in Los Angeles as assistant manager, Fuel Oil and Asphalt Sales. When 1930 rolled around he was promoted to the post of Manager of Fuel Oil and Asphalt Sales and he held this position up to World War II.

Mr. Wolff joined the Navy Supply Corps with rank of Lieutenant-Commander in charge of various activities in connection with Navy petroleum procurement, storage and distribution. He was also in charge of the Navy Fuel Depot at San Pedro during its construction and organization. He next became officer in charge of the Army and Navy Petroleum Pool, headquarters at San Francisco and had jurisdiction over all petroleum activities of the Western Sea Frontier. In this assignment Mr. Wolff had advanced to rank of Captain.

In January of 1946 Captain Wolff resumed his post as manager of Refinery Sales with Union Oil. He is a charter member of the Propeller Club, Port of Los Angeles-Long Beach, and is widely known throughout Pacific Coast shipping circles.

▲ Lawrence Wolff, manager of Refinery Sales, Union Oil Company of California.

John Heaney, naval architect and interior designer in New York.

▼

M. F. Cropley, new vice president of Matson.

C. E. Bradley, freight traffic manager of Matson.

Cropley is V. P. of Matson, Bradley is Traffic Manager

Election of M. F. Cropley as vice president of the Matson Navigation Company in charge of Freight Traffic is announced by John E. Cushing, president of Matson. Mr. Cropley, who has been freight traffic manager for many years, will be succeeded in this capacity by E. J. Bradley, formerly assistant freight traffic manager.

He has been associated with Matson since 1926, and is widely known in the shipping industry.

Mr. Bradley joined the company in 1923 and has a wide experience in the freight traffic problems of the Pacific Coast, Hawaii and other areas served by Matson. During World War II he served as U. S. Shipping Administration Director for the United Kingdom, returning to Matson at the end of the war.

John Heaney, Naval Architect, Opens Offices in New York

John Heaney, naval architect and interior designer has opened offices at 139 West 54th Street, New York City. Born on the Clyde in Scotland, Mr. Heaney was educated in shipping and ship buildiing from an eaerly age. In the past nine yeaers that he has been connected with George G. Sharp, New York, he rose quickly to the position of Chief of Interior Design.

In this capacity he designed the interiors of nine Robin Line vessels; the Milwaukee Clipper on the Great Lakes; the Del Norte, Del Sud and Del Mar for the Mississippi Shipping Company; the three new Alcoa ships; and the liners, President Wilson and President Cleveland for the American President Lines which will be completed this summer in Alameda, California.

Mr. Heaney is consultant to various steamship companies and other marine contractors.

He is a member of the Society of Naval Architects and Marine Engineers and of the Propeller Club of the Port of New York.

Fred Murdock, president of Pacific Coast Instrument Co., Inc., in front of office with technical staff.

Pacific Coast Instrument Expands

The Pacific Coast Instrument Company of San Francisco has recently been appointed Pacific Coast sales and service representatives for the S. G. Brown, Ltd. gyroscopic compass and automatic helmsman.

In order to provide expert technical service in the repair and sale of this equipment the company sent a member of its staff, Charles A. Cooper, to London for an intensive eight weeks course in the theory and maintenance of the compass and helmsman.

Cooper, who has just returned from London, is particularly qualified for this work having spent the past ten years in the manufacturing and repairing of industrial, aircraft and marine instruments. Four of these years he was connected with Pan American World Airways at San Francisco in the instrument and electrical department. Then followed a couple of years with the Spartan Aircraft Corporation and another year at Tulsa, Oklahoma, where he operated his own shop for repairing aircraft instruments.

Desiring to return to San Francisco, Cooper disposed of his shop about a year ago and joined the veteran Pacific Coast Instrument Company's repair organization.

Charles A. Cooper of Pacific Coast Instrument Co., Inc.

The Pacific Coast Instrument Company, which was founded some twenty-one years ago, was reorganized about a year and a half ago and moved into new and enlarged quarters at 246 Mission Street. Under the management of Fred Murdock, president, the company has enjoyed a rapid expansion in business more than doubling its office and technical staff since moving into its new home.

In addition to the Brown gyroscopic compass and automatic helmsman the company is sales representatives for Helicoid Gage Div. American Chain & Cable Co., Trimount Instrument Co., Paxton Mitchell Co., Paxton Diesel Engineering Co., W. C. Dillon Co., Inc., and General Electric Company, Special Products Division.

Moore-McCormack Appoints Coast Passenger Agents

Moore-McCormack Lines, Inc., announce the appointment of Watson Smith as district passenger agent at Los Angeles, and Hugh R. Cawsey as district passenger agent at San Francisco. Subsequently, a district passenger agent will be appointed for the Pacific Northwest, with headquarters at Seattle.

These appointments preceded the re-entry into service of the "Good Neighbor" passenger ships— Argentina, Uruguay and Brazil—which were used as troop carriers during World War II, and which were featured in the June Pacific Marine Review. They are now undergoing final reconversion. The Uruguay is in the Federal Shipbuilding and Drydock Company yards at Kearny, New Jersey; the Brazil, at the Atlantic Basin Iron Works in Brooklyn, New York; and the Argentina in the Bethlehem Steel Company yards at Brooklyn, New York.

The S.S. Quirigua leaving Bethlehem's Staten Island Yard after her conversion from a naval auxiliary

Cruise Queen CONVERSION

In August, 1946, a drab, gray vessel slipped into Bethlehem's Staten Island Shipyard. The designation "F 12" on bow, gun mounts, sealed ports, armored deck structures, ammunition magazines and hundreds of berths jam-packed into every nook and cranny not given over to the transportation of cargo marked the ship as a naval troop and refrigerated provision carrier.

It was almost impossible to believe that she was the United Fruit Company's S.S. Quirigua, Spanish Main Cruise Queen of the prewar decade. And it was difficult to believe that she could be restored, as the conversion specifications required, to the state of luxury she represented in that era.

In February, 1947, she left the Bethlehem Yard, her snow-white hull symbolizing completion of her conversion and return to the Great White Fleet. More than 40 of her waterline plates had been replaced and reinsulated. Some 800 tons of concrete ballast had been torn from her hull. Her cargo-handling equipment, holds, refrigeration machinery, ventilating, fire-alarm and general-alarm systems, and her main engines and auxiliaries all had been completely reconditioned. Her gracious main dining room, handsome lounge, dignified library, smart smoking room, gay verandah cafe, deck-swimming pool, comfortable staterooms and teak decks all had been restored to a state of luxury. Inside and out, she was again the deluxe mail-class ship which Bethlehem's Quincy Yard built in 1932.

Conversion of the Quirigua was typical of all Bethlehem jobs—accomplished with maximum speed and economy and completely satisfying the requirements of the owner and all regulatory and classification authorities.

SHIPBUILDING YARDS

QUINCY YARD
  Quincy, Mass.
STATEN ISLAND YARD
  Staten Island, N. Y.
BETHLEHEM-SPARROWS POINT SHIPYARD, INC.
  Sparrows Point, Md.
SAN FRANCISCO YARD
  San Francisco, Calif.
BETHLEHEM-ALAMEDA SHIPYARD, INC.
  Alameda, Calif.
SAN PEDRO YARD
  Terminal Island, San Pedro, Calif.

SHIP REPAIR YARDS

BOSTON HARBOR
  Atlantic Yard
  Simpson Yard
NEW YORK HARBOR
  Brooklyn 27th Street Yard
  Brooklyn 56th Street Yard
  Hoboken Yard
  Staten Island Yard
BALTIMORE HARBOR
  Baltimore Yard
SAN FRANCISCO HARBOR
  San Francisco Yard
  Alameda Yard
SAN PEDRO HARBOR (Port of Los Angeles)
  San Pedro Yard

SHIP BUILDING . . . SHIP CONVERSIONS . . . SHIP REPAIRS
NAVAL ARCHITECTS and MARINE ENGINEERS

BETHLEHEM STEEL COMPANY
Shipbuilding Division

GENERAL OFFICES: 25 BROADWAY, NEW YORK CITY

Pacific Marine Review

NEWS FLASHES

BIG WEST COAST CONVERSION JOB

The $4,914,406 contract awarded to Bethlehem Steel Company's San Francisco Yard for the conversion of two C-3 type Army Troop Transports, the David C. Shanks and the Fred C. Ainsworth, represents the largest conversion job of this type performed on the Pacific Coast since the war.

Besides refurbishing passenger, crew and troop quarters, specifications call for redesigning, rebuilding and increasing the capacity of the ventilation system on each ship.

The two ships, built at Ingalls in 1940, are similar to the wartime C-3.

Two similar vessels, the Goethels and Gibbons, are to be converted in the East.

* * * * *

PACIFIC COAST-TO-EUROPE SERVICE TO BE OPENED

The States Marine Corp. will establish regular freight services from Pacific Coast ports to northern Europe and the Mediterranean. The service will replace regular sailings the company has been maintaining for a year from Vancouver, Seattle, Portland, San Francisco and Los Angeles to the Bordeaux-Hamburg range of ports in Europe and the Marscillo-Piranous range in the Mediterranean. The company recently entered the Pacific Coast-European Conference as the only American member. J. O. Senner, vice president of States Marine in charge of Pacific operations, said that the company is convinced it has enough business to establish a liner service, using its own C-2s in the regular service and will supplement them with chartered vessels as the trade demands.

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BIDS SUBMITTED FOR EX-CARRIERS

The Waterman Steamship Corp. submitted high bids for seven of nine former escort aircraft carriers which they plan to convert for cargo purposes. Waterman plans to enter the ships after reconversion in offshore trade and will reconvert these vessels to their former status as C3-A2 type cargo ships, which in addition to their cargo-carrying capacity will have accommodations for twelve passengers in six staterooms, each with private bath. The reconversion work on the ships will be done at the Gulf SB Yard in Mobile, a Waterman subsidiary. Waterman had previously purchased seven escort-type carriers from the Government.

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NATIONAL BEARING COMPANY BUYS WHITTIER PLANT

The National Motor Bearing Company, of Redwood City, announced purchase of 14 acres near Whittier as the site for a new $700,000 factory for its subsidiary, Arrowhead Rubber Company.

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HERMITAGE IN DRYDOCK

The 650 ft. 24,000 ton Army transport "Hermitage" is in drydock at Bethlehem in San Francisco in preparation for return to the Italian Government under her former name "Conte Biancamano". This is the largest vessel ever to be handled in a floating drydock on the Pacific Coast. See details and pictures in next month's Pacific Marine Review.

BIDS ON ARMY DREDGE

The proposed giant dredge for the Army Engineers is reported to have gone to the low bidder, Sun Shipbuilding Company, at $9,600,000 with completion in 669 days. Other bids follow:

Newport News	$ 9,850,000	590 days
Bethlehem Foreriver	11,357,000	700 "
Federal Ship	12,140,000	730 "
New York Ship	13,625,000	600 "
Ingalls	13,783,000	900 "

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LABOR UNION PROMOTES SHIPBUILDING

In an information campaign unique in Labor history, John Green, president of the Industrial Union of Marine and Shipbuilding Workers of America has launched a program of page ads in newspapers, radio, booklets and other forms to focus attention on crucial importance of modern ships and shipbuilding to American stability and National security. The ads are well worth reading.

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STANDARD OIL TO BUILD PIPELINE

Standard of California, at a cost of more than $5,000,000 will build a pipeline from the Rangely oil field in Colorado to a point near Salt Lake City.

* * * * *

BLACK DIAMOND PLANS TEN 20-KNOT SHIPS

The Black Diamond Steamship Company is completing plans for ten of the fastest freighters under the American flag for its service to Rotterdam and Antwerp. With turbines of 12,000 hp the ships are expected to cruise at 20-knots with a possible 22-knots in fair weather.

* * * * *

BIG MARINE INSURANCE ITEM

In announcing the early completion of the new A.P.L. liners President Cleveland and President Wilson, the company estimates annual insurance expenditure of $800,000, to be placed in San Francisco. Other big annual expenses will include $480,000 for fuel oil, $350,000 for normal repairs, $80,000 for port charges, $320,000 for stevedoring.

* * * * *

INTERCOASTAL FLEET CHARTERS APPROVED

The following nine steamship companies have had their fleet charter applications approved for intercoastal and Pacific coastwise operation.

American Hawaiian	10 ships
Arrow Line	3 "
Isthmian Steamship	6 "
Luckenbach	9 "
Pope and Talbot	3 "
Quaker Line	4 "
United States Lines	3 "
Coastwise Line	4 "
Union Sulphur Company	continues present charter
Burns Steamship	
Olympic Steamship	
James Griffiths	

All but one of the intercoastal are Victory ships. Coastwise Line gets Libertys. The last three companies on the list have qualified approval cnly.

TRADE WITH JAPAN OPENING UP

With the reopening of import and export trade with Japan on August 15, extensive plans for visits to Japan by American business men are announced by the department of Commerce. See details in World Trade Section of this issue.

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WORLD TRADE CENTER APPROVED

San Francisco's great World Trade Center project won sweeping approval in both houses of the California Legislature during the session just ended.

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TODD AWARDED 10 TANKERS FOR STRAPPING

The Brooklyn and Hoboken yards of Todd's Shipyard Corp. has been awarded the first 10 T-2 tankers to be strapped in compliance with American bureau requirements. See next item.

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AMERICAN BUREAU ISSUES ORDERS ON WELDED TANKERS

It is estimated that there are 300 T2-SE-A1 tankers presently owned by private operators and the Maritime Commission which require modification under new American Bureau specifications. There are to be two steel straps 191 feet long and 12½ inches wide to be rivited to inside of hull port and starboard between outside bulkheads of tanks 3 to 8 and two 15 inch straps of same length on port and starboard side of deck. There are also certain keel changes on vessels built early in the war.

This program of strapping is expected to be completed in five months.

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ONE MILLION TONS TO BE SHIPPED FROM LONG BEACH

The largest single commercial shipment ever to be assembled at one port is being prepared for shipment from Long Beach harbor via Isthmian Steamship Company. It will consist of 400,000 tons of steel pipe for Saudi Arabia plus a similar amount in pumps, valves and building material. These figures are in weight. In measurement the total exceeds 1,000,000 tons and the value is estimated at $500,000,000. Consolidated Steel is making the pipe and Standard Oil and Texas Company are the shippers.

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STATUS OF LAY-UP FLEET

The number of ships in Maritime Commission anchorages has been reduced by 539 ships this year, leaving a total of 1203. Movement in and out of the reserve fleet sites follow:

Suisun Bay, California,	7	entered	9	withdrawn	Total	354
James River, Virginia,	2	"	21	"	"	390
Mobile, Alabama,	4	"	9	"	"	89
Astoria, Oregon	3	"	10	"	"	113
Olympia, Washington,	1	"	2	"	"	96
Hudson River, New York	4	"	2	"	"	42
Beaumont, Texas,	0	"	0	"	"	32
Wilmongton, N. Carolina	7	"	4	"	"	59
Brunswick, Georgia,	0	"	0	"	"	28

* * * * *

AMERICAN BUREAU EXCHANGES WITH CANADIAN GROUP

The AmericanBureau of Shipping announces the formation on June 11, of the Canadian Committee of the British Corporation Register of Shipping and Aircraft with which the American Bureau will exchange representation in various parts of the world.

* * * * *

COMPRESSED AIR TOOLS IN WORKBOAT

ONE OF THE BIG POSTWAR ASSIGNMENTS for the West Coast workboat builders was to restore the Pacific fishing fleet to full complement. The shipyard of the National Iron Works at San Diego, Calif. offers an example of the remarkable dispatch with which this urgent work is being carried out.

No longer do military guards stand at the shipyard gates, Navy uniforms are gone from the scene, but the busy clatter of building boats remains and big steel tuna boats are being launched and old boats are being repaired for the profitable tuna trade.

A familiar sight in war or peace around the shipyards is the tools with which the boats are being fashioned. Most of these tools are powered by compressed air—for drilling, chipping, reaming, grinding, painting, sandblasting and other work. They were being used when speed, alone, was the main consideration and now that operations must be measured with an eye to competition and profitable outcome on a fixed price contract, the reasons for their continued use are especially noteworthy in a peacetime economy.

A typical application for pneumatic tools in the National Iron Works shipyard is shown in Fig. 1, grooving between main deck plates in preparation for a weld. By making a deeper V in this manner with a chipping hammer, a better weld is obtained, especially in the case where the weld is made from one side only. As all chipping hammers have a throttle valve which graduates the air supply so that the hammer may be started slowly if desired and operated at any pace, the tool is flexible in application and easy to handle because the return stroke of the hammer is cushioned by compressed air and because of the relative lightness of the tool for the power delivered.


1

Fig. 1—Grooving of main deck plates for welding goes faster and more economically at the National Iron Works shipyard with the aid of compressed air-operated chipping hammer. The work is being done on the "Ruthie 8," new 110-foot tuna boat.

L. G. Maple, plant engineer at National Iron Works, keeps a sharp eye out for costs in all yard operations. A heavy-duty chipping hammer operating approximately 40 per cent of the time will consume about 720 cubic feet of air per hour. At 5 cents per thousand cubic feet, it costs 3.5 cents an hour for the air power required to operate

Fig. 2—The Mary Barbara, a 106-foot, steel tuna boat as she neared completion at the San Diego yards of the National Iron Works.


2

Fig. 3—Spray painting will enable the yard to launch this boat days sooner than if hand brushing were used. Most surfaces of the boat are painted with this type of air-operated equipment.


3

Data and photos for this article were obtained by the Compressed Air and Gas Institute through the courtesy of National Iron Works, San Diego, Calif.

Fig. 4—Sandblasting is used on many operations in building tuna boats. Here, it is used for cleaning part of an ammonia coil for refrigerating system.

Fig. 5—In the foreground is the National Iron Works' 750 cubic foot per minute air compressor, driven by a 100-horsepower motor. Next is a 220 cubic foot per minute air compressor driven by 67-horsepower motor.

Fig. 6—This 2-ton, air motor-operated hoist in the company's structural shop is one of ten in use. Ease of operation and absence of overhead trolley were among the several factors governing the choice.

the hammer. The big cost factor in this case then is the wage of the operator rather than the cost of the power for the tool and if a worker can greatly increase his output with the right tool, as he does with the pneumatic chipping hammer, the overall cost of the operation is reduced.

A modern steel tuna boat such as the Mary Barbara in Fig. 2, and which was featured in the April Pacific Marine Review, costs approximately $350,000. Even a small percentage of the building cost saved amounts to a considerable sum in dollars. Spray painting, (see Fig. 3), is used wherever possible as one man with an air spray will do the work of several with brushes. One of the especially interesting "spray paint" applications is found in the method of galvanizing the bottom of the boats.

The galvanizing process is similar in method to that of applying melted metal to build up crankcases and similar parts. For the boats, the metal used happens to be zinc rather than steel. Air pressure applies the melted metal to the clean, sandblasted surface of the boat. Another airline is a part of the application set-up and it serves to cool the hot metal as it is sprayed on the ship's bottom.

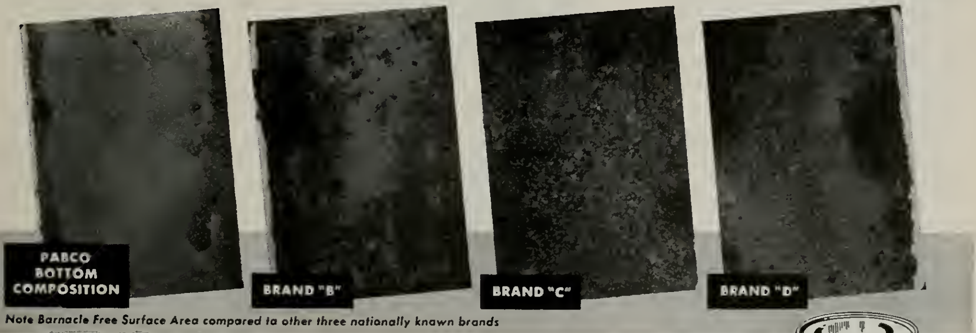
All weather surfaces of the steel boats are sandblasted before painting or galvanizing. The National Iron Works has three air-operated sandblasting units for the several needs of this equipment. Fig. 4 shows a sandblasting operation on a section of ammonia coil for the ship's fish refrigeration system. In instances where the pipe has only a light rust, the quicker system is to pickle the pipe, but wherever scale and rust is heavy, National Iron Works' experience has been that sandblasting is the faster, better method. The fish well of tuna boats also is sandblasted after construction and before painting with water-resistant paint. The smooth surface thus obtained improves adherence and reduces the tendency of paint chipping.

To provide ample air power under all conditions in its shipyard, structural shop and foundry, the San Diego company has three air compressors of 750, 360 and 220 cubic feet per minute capacity. Fig. 5 shows two of these compressors, the largest and the smallest. The third one

(Please turn to page 98)

◄ Fig. 7—A steam hammer operated by compressed air has many uses in the structural shop. Power is always ready for whatever work is to be done.

► Fig. 8—Once a squeeze riveter, this equipment now serves as a bulldozer in the structural shop.



Note Barnacle Free Surface Area compared to other three nationally known brands

Keep Posted

New Equipment and Literature for Yard, Ship and Dock

New Unloading Pump of Borg-Warner

An innovation in hydraulic systems, a compact unloading pump which eliminates many pieces of equipment ordinarily required, was announced by R. J. Minshall, president of the Pesco Products Division of the Borg-Warner Corp.

In the new pump Pesco engineers have made unnecessary a check valve, a relief valve, an unloading valve and a pressure accumulator, with a resultant reduction in weight and cost of vital importance to aviation and industrial users.

This pump, which is of the hydraulic gear type, is essentially two pumps within a single housing. A pilot valve, which is an integral part of the pump assembly, controls an opening in the passage communicating from the outlet port to the rear of the movable bearings in the cover of the pump. When a specified pressure has been reached in the hydraulic system, the pilot valve closes the passage to the rear of the bearings, thus eliminating the pressure loading. The pressure in the gear teeth area forces the cover bearings away from the gears, and immediately the large section of the pump ceases to deliver fluid with a consequent decrease in horsepower input requirement.

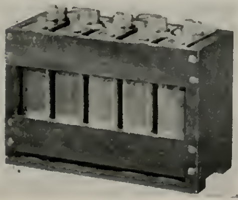
Your "Distance Run"

Who remembers the associations of heaving the log in windjammer days, whilst running down from the Cape, when seas boiling up astern hove the line ahead as soon as it was cast and threatened to wipe out the existence of the men who held the sand glass and vibrating cumbersome log reel. Sea customs and traditions are hard to overcome and it was some years before navigators put their faith on the records of patent logs.

In this sphere, the firm of Thos. Walker & Son Ltd., Birmingham, Eng., has held a unique position for nearly a century. First came their Harpoon Log, the whole of which (register and rotator) was towed in the water and had to be hauled in to take a log reading. Then followed their well-known "Cherub" Taffrail Log and finally, their latest development, the "Trident" Electric Log which enables the navigating officer to read the log over the chart at any moment—a great advantage in fog or at night.

Additional instruments of Walker manufacture are the "Excelsior" Log, specially designed for use on yachts, motor-boats and small craft and the "Viking" Connector, which, fitted on a boom, allows the log to be streamed amidships. During the late war, the British Admiralty requisitioned nearly the whole of their output and placed a severe embargo on the export of their products. Now, however, the firm is again in a position to meet the many demands which are being made for their well known instruments.

A Storage Battery by Baker & Company



Detecto-Master Fire Alarm System
The Lord-Taber Co., Inc., of Canandaigua, New York, manufacturers of the "Detecto-Master" fire and cold alarm system, which is a new and completely automatic aid in locating and detecting serious fire hazards.

A Storage Battery by Baker & Co.

A cadmium nickel alkaline storage battery which combines advantages of lead acid and nickel iron alkaline batteries is being introduced by Baker and Company, Inc., refiners of precious metals, Newark, New Jersey. New battery is particularly applicable to marine use and is sturdily constructed of heavy, nickel-plated steel, and has low internal resistance and will not self-discharge on open circuits.

Interlocked Flexible Metal Hose

The Pennsylvania Flexible Metallic Tubing Company, Philadelphia, Pa., announces a development of a new ⅛ inch size in its complete line of interlocked flexible metal hose. These sizes now range up to 30 inches I.D. The new size is designed as a means to protect capillary tubes used in industrial recording instruments, and is made of bronze, steel and various alloys. It may be furnished in up to 100 foot lengths.

Hot Off The Press

EXTERNAL-PILOT-OPERATED PRESSURE CONTROLLERS: Bulletin No. 462, a new 20 page illustrated booklet titled: "Engineering, Operating and Maintenance Data on Pressure Controllers, External-Pilot-Operated" has just been released by Leslie Co., Lyndhurst, N. J. Design features of the control pilots and associated diaphragm regulating valves are illustrated in large cross-sections which show the many exclusive Leslie features—wide selection of operating media, air, clean gas, water, and light oils; non-continuous leakage of operating medium; hard surface seat rings and 800 Brinell hardened stainless steel main valves, single seated, fulled balance construction, the new "Conden-Seal" cooling bonnet, reversing superstructure.

"FINISHES FOR ALUMINUM" described by Reynolds Metals Co., with the increasing use of aluminum for various purposes in ship construction, and to indicate some of the important possibilities for surface finishes, Reynolds has published this book in two volumes. Copies are available from Reynolds Metals Company, Dept. 27, 2500 So. Third St., Louisville 1, Ky., price $2.00.

The first book, SECTION ONE, is wire bound and contains 108 pages devoted to 8 cleaning treatments, 17 mechanical surface finishes, 15 chemical surface finishes, 11 electrolytic oxide treatments, 12 electroplated coatings, 7 paint application methods, 7 paint coatings, ceramic coatings (vitreous enamels), special finishes such as silk screen and sprayed metal finishes, and concludes with a discussion of various controls and tests for finishes.

The second book, SECTION TWO, supplements this information with 120 pages of shop data on materials, equipment, solution preparation, procedure and control for more than 30 of the most widely used finishing processes. This book is supplied in a separate loose-leaf binder and new and revised bulletins will be issued at intervals to keep this information up-to-date.

MARINE REFRIGERATION an illustrated catalog on marine refrigeration and air conditioning, emphasizing how they can increase ship operating revenues, has just been issued by the Marine Department of Carrier Corporation, New York, leading marine air conditioning and refrigeration manufacturer.

Various types of marine installations are shown, as well as different types of equipment, including centrifugal refrigerating machines, reciprocating compressors, suspended and deck type cold diffusers, marine ice makers, and weathermakers. Tables of physical data are also given.

MAINTENANCE HINTS for general purpose turbines are contained in a new 6¾ by 3⅞ inch handbook announced by the Westinghouse Electric Corporation. The booklet (B-3747) first describes the steam turbine, explains how it operates, and tells how it should be installed. Directions for piping, joint sealing and lubricating are given. Dismantling of the turbine for complete inspection once a year is recommended, and points to be checked and recorded are listed. Necessary repairs and adjustments are discussed under the heading of the various parts—rotor, bearings, glands, governors, nozzles overspeed trip, speed changer, reduction gears, and oil parts. The final chapter gives emergency hints for quick reference if the turbine is not operating properly.

Warren Steam Pump Observes Fiftieth Anniversary

During the first several years, after February 1897, when Warren Steam Pump Company began in Warren, Massachusetts, reciprocating pumps were the sole product of this company, and into them went the skill of determined New England craftsmen . . . whose main objective, as it is today, was to build the best possible pump. Constant research and development speeded the accomplishment of this purpose and the business prospered, making expansion of plant and facilities necessary until today the main machine shop is nearly 700 feet long and houses the most modern equipment for the production of both centrifugal and reciprocating pumps.

Warren entered the marine field in approximately 1904 and the first real Navy order was completed in that year. It covered twenty small vertical, single piston pumps for boiler feed service on Navy steam launches. The first major contracts for Naval vessel equipment came in 1910 when a shipyard contracted for all of the steam pumps for two destroyers, with the exception of one item, which was of a type Warren was not building at the time. The first contract for the pumping equipment for a large Naval vessel came in 1912, when a contract was received for the steam pumps for the battleship Oklahoma. In those days very few centrifugal pumps were used, other than for main condenser circulating.

Yes, Warren Pumps went to War . . . both World War I and II. During World War I the company's efforts were largely devoted to supplying steam pumps for the Navy's destroyer program. When World War II came, Warren Pumps saw action on practically every type of fighting vessel . . . battleships, heavy and light cruisers, destroyers, destroyer escorts, aircraft carriers, submarines and all kinds of auxiliary craft, including thousands of landing vessels. In recognition of a major contribution to victory, the company was awarded the Army-Navy "E" on August 24, 1943, and stars were added later as proof of successful efforts to not only maintain but increase the high production levels previously reached. H. Ward Hathaway, who entered the employ of the company in 1904, is manager of the Federal and Marine Department, a position held by him through both World War I and II.

In the year preceding 1928, many famous coastwise passenger ships and freighters were built and equipped with Warren pumps. In the years following 1928 when shipbuilding received a new lease on life, Warren furnished pumping equipment for such well-known ships as SS Argentina, Brazil and Uruguay, SS President Hoover and President Coolidge, SS Mariposa, Monterey and Lurline, SS Talamanca and five sister ships of United Fruit Company, SS Manhattan and Washington, SS President Jackson and six sister ships; also SS America.

West Coast representatives of Warren Steam Pump Company are George E. Swett & Company, San Francisco, Gil Moore & Company, Los Angeles, and R. L. Dyer, Seattle, Washington.

Left to right: William Nelson and Joseph Ures of Crane Packing Company. Alongside is new headquarters of Crane in San Francisco.

Crane Packing Changes

Crane Packing Company, makers of "John Crane" metallic and fabric packings and mechanical seals, announces changes in both personnel and location of their San Francisco Branch office.

William Nelson is the newly appointed northern West Coast manager. He is a graduate of Purdue University in Power Plant Engineering, and comes to the West Coast with ten years experience in the Crane organization. Previous to this appointment, he handled the Wisconsin, Minnesota and Northern Illinois territory, and now takes over the management of the San Francisco office, which territory includes Northern California, Washington and Oregon.

The company also announces appointment of Joseph Ures as Marine sales engineer. Mr. Ures attended UCLA, was wounded at Pearl Harbor on December 7, and after considerable shipyard experience joined the Crane organization, where for the past three years he has been devoting the major portion of his time to the marine field. He is a member of the National Association of Power Engineers.

In order to give better service and for more convenient location, the company has moved its office and warehouse to 53 Stevenson Street, in San Francisco, where larger stock can be carried to facilitate delivery.

International Nickel Appointments

Hugh J. Fraser, vice president of The International Nickel Company, Inc., has been placed in general charge of all plant operations of the company in the United States. John A. Marsh, assistant general manager of the Huntington (West Virginia) Works, has been appointed Mr. Fraser's assistant, with the title of Assistant to the Vice President.

WESTINGHOUSE APPOINTEE

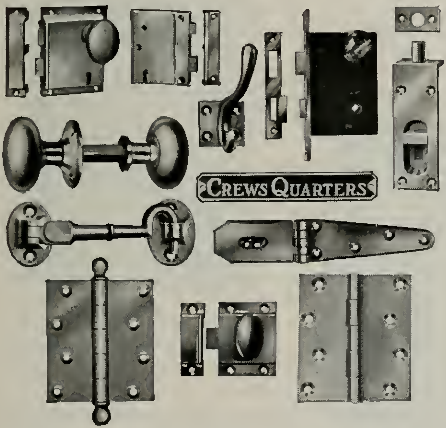
S. H. Harrison, above, has been appointed manager of the Industrial Division of the Westinghouse Electric Corporation, Pacific Coast District. He will make his headquarters at San Francisco.

GETTY

Since 1922, H. S. Getty & Co., Inc., has supplied fine marine joiner hardware for shipping all over the world. We are proud to report also that marine hardware for most of the ship construction during the war years for the U. S. Navy, U. S. Maritime Commission and the U. S. War Department bears the name of Getty. Our products are made to no less exacting specifications, no lower standards of quality, in the years of peace.

What we show here are but a few representative samples of the complete Getty line of fine marine joiner hardware. We have been called upon many times in the past to fabricate special items to meet unusual conditions; we welcome the opportunity to do so again in the future.

Skilled craftsmen, with the sure knowledge born of experience, uphold the Getty traditions of exactness, reliability and integrity unmatched in marine hardware. Such is the heritage of the products which we are proud to present here. Only the best is good enough to bear the name of Getty; only the best is good enough to withstand the rigors of marine service.



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A Correction

In our June issue we got so fouled up on anti-fouling compounds that it took two paint companies and the U. S. Army Transport Service to steer us straight!

On page 68 we showed this picture of the U. S. Army Transport Admiral W. S. Benson in drydock after (we said) seven months in South Pacific waters, and credited the "clean-as-a-whistle" condition of her underwater body to the efficacy of Manning-Mitchell's marine paints.

Now, we learn that the excellent condition of the Admiral W. S. Benson should have been credited to the effectiveness of American Marine Paint Company's anti-corrosive and ant-fouling paints.

Pacific Marine Review is glad to publish this correction with the assurance that the error was unintentional!

The Tides

(Continued from page 66)

diurnal inequality between the two highs and the two lows.

Figure 7 illustrates graphically the three different types of tides.

Reference Planes and Tide Tables

The reference plane, found on the navigator's charts, indicates to what height of water the soundings were measured from. There are several different reference planes. For example, the East Coast tides are of the semi-diurnal variety, and therefore there is not much difference between the depths of the two low waters. Their reference plane is mean low water, which is just the average of the two low waters each day. On the Pacific coast our tides are of the mixed variety, with a great difference between the two low waters of each day. Accordingly, for safety's-sake, our reference plane is mean lower low, or the average of all of the lower of the two daily low waters. To find the actual depth of water at any time, the height of the tide is added to the charted depth. If the height of the tide is negative (if there is a minus sign (—) before the tabular height) then it is subtracted from the charted depth. Changes in wind and barometric conditions cause variations in the sea level from day to day, however. In general, with onshore winds or a low barometer the heights of both the high and low waters will be higher than predicted, while with offshore winds or a high barometer they will be lower.

The tide tables have been compiled and published by the Coast and Geodetic Survey, Department of Commerce, since 1853. They are now published in two volumes, one for the Atlantic ocean and one for the Pacific and Indian oceans. Table one of the Pacific edition covers fully daily tide predictions for 81 reference stations. (See Figure 8.)

Table two covers tidal differences and constants for about 2000 places in the vicinity of the reference stations, thus allowing the user of the tables to compute the estimated time and height of tide for almost any particular point. Predictions for a place in table two are obtained by applying the time differences and height differences to the predictions for a station in table one. (See Figure 9.)

The volume also contains a table for computation of the height of the water at any time, times of sunset and sunrise, times of moonset and moonrise, and astronomical data pertaining to the moon and sun. At the present time the predictions in the tables are made by means of the Coast & Geodetic Survey tide predicting machine No. 2.

To demonstrate the use of the tables, we would proceed this way to find the time and height of the afternoon high tide at Alameda, California, on Saturday, June 7th, 1947.

TABLE	TIME	HEIGHT
From Table 1 (Fig. 8)	1539	4.3
From Table 2 (Fig. 9)	40	0.7
	1619	5.0

The afternoon high tide, therefore, is expected about 4:19, and will be about a 5 foot tide.

It is interesting to reflect, as one uses the tables, that accepting their figures and computations is a factual demonstration of man's faith in an accepted order— for they *are* but predictions— and no one can prove just *why* the tides will occur as the tide tables say they will!

A. L. HAKANSON IN CHARGE OF ARNOT PRODCUTION

A. L. Hakanson has been appointed to take charge of all production for Arnot and Company in Baltimore, Maryland. He was formerly connected with Oregon Shipbuilding Corporation, Portland, Oregon, and in New York. In New York he worked as marine engineer on the extensive Victory ship program for Kaiser, and recently on the conversion of three combination passenger-cargo vessels for the Alcoa Steamship Company. During his association with the Kaiser Company he was in charge of all field engineering on piping for the Liberty ship program and later acted as liaison officer between Kaiser, the Maritime Commission, naval architects, and the American Bureau of Shipping.

A. L. Hakanson in charge of all production for Arnot & Company, Baltimore.

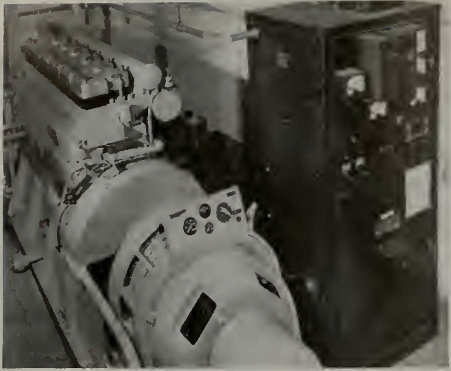
As production manager of Arnot and Company, Hakanson will handle the furniture and furnishings for the SS President Cleveland and SS President Wilson; the Panama Line's three conversions; the French Supply vessels at Tampa; the Corsair and Vixen; and the Army program for the conversion into troop transports of several P-2s, as well as various Maritime Commission conversions and other marine interior work among the present Arnot contracts.

Mr. Hakanson was born in Idaho and received his LLB degree from the University of Oregon in 1936, after which he practiced law for four years in The Dalles, Oregon.

MORE ON NATIONAL MARITIME DAY

Above: Captain John E. Murphy of American President Lines was awarded the Merchant Marine Meritorious Service Medal by Admiral W. W. Smith, chairman, U. S. Maritime Commission, at the National Maritime Day luncheon in San Francisco.

At right: The strip includes dignitaries in the Review Stand during the Maritime Parade on the morniing of National Maritime Day. Presiding Queen with Admiral Smith, and Mayor Roger Lapham of San Francisco. The prize-winning float is shown in the third picture from the top.



Navy installs diesel at Federal Building.

Navy Installs Diesel at Federal Building

In the heart of busy San Francisco is the Civic Center where City, State, and Federal buildings are located. The Navy recently installed in the Federal Building a 150 kilowatt 120/208 volt, 3 phase emergency diesel generator set in order to prevent any possibility of naval communications being interrupted due to power failure.

A "Sterling Viking" was selected as best meeting the requirements of reliability combined with quick starting and minimum dimensions. The engine Model VDS-6 is a 4 cycle solid injection type having 8 inch bore by 9 inch stroke and running at 1200 rpm. The engine more than met the Navy tests and overload requirements developing up to 320 brake horsepower. Sterling's Viking, although offering all the advantages of weight and dimensions over the usual slower speed engine, offers equal reliability through its advanced design and use of special materials.

The equipment consists of an engine and generator, unit mounted on a deep section steel base which floats on 1" thick neoprene strips. The radiator with its electric motor driven fan, and the exhaust silencer are located outside the building in an area-way.

The generator control, load transfer breaker and engine automatic starting equipment are contained in a steel cubicle alongside the G. E. generator. A novel feature of the control equipment is provision for automatic momentary paralleling of the emergency generator with the normal power source. A special syncronizing relay operator in conjunction with a manual control so that when the operator wishes to return the load to normal power source he operates this control and, as the two power sources come into synchronism, the normal power breaker closes. Immediately thereafter, the emergency power opens and the automatic equipment stops the engine. This special feature was incorporated in order to avoid even a momentary power outage upon changeover because the naval communications equipment served by this power plant is of an automatic nature and any power break whatever would cause errors in transmission.

The plant was engineered and installed by King-Knight Company, San Francisco, who have for many years specialized in stand-by power plants and automatic control equipment.

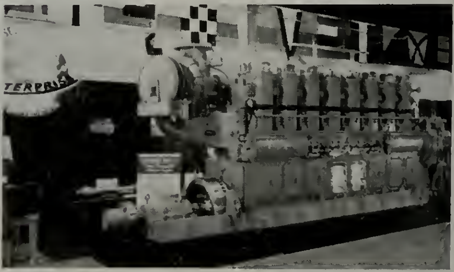
This same "Viking" 8" x 9" engine is built for marine propulsion developing up to 650 horsepower and is supplied both with and without reduction gears.

Miniature Sperry Control

A new miniature Sperry hydraulic remote control consists of two units, a transmitter and a receiver, which form a self-contained, completely enclosed, hydraulic system when joined together by a single line of tubing and filled with oil. Only two small bolts are required to mount each unit in place. Copper tubing or flexible hose, which may be run through or around obstructions or bulkheads, makes it possible to install units in any location and to obtain remote control at distances up to 35 feet.

The Transmitter of Sperry's miniature Hydraulic Control unit is no bigger than your hand. Receiver is identical except that a lever replaces the knob handle.

Enterprise Booth at Exposition



Enterprise Engine & Foundry Company booth at the recent National Marine Exposition.

In the foreground is an Enterprise Model DMG-38 marine engine rated 825 brake horsepower at 400 revolutions per minute, giving a good view of the turbocharger installation. In the right background, looking almost like an extension of the big engine, is the Enterprise Model DMM-3 rated 108 brake horsepower at 720 revolutions per minute. This engine is adaptable to either marine or stationary use.

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At top: Wilmington office of Republic Supply Co. Below: New Fresno office.

Two New Stores For The Republic Supply Company

The service and supply facilities of the Republic Supply Company of California are further extended with the addition of the two new stores shown herewith. The building in Wilmington is a new structure at 607 West "B" Street. This replaces the store which Republic has maintained in Wilmington for some years. Recently erected by Republic, the building is designed and laid out for efficient handling of oil field and industrial supplies, with excellent truckloading facilities and customer parking space.

The store in Fresno is not only a new building, designed and built by Republic to meet the needs of the supply business, but is a new location for Republic. This store brings to Fresno an excellent supply source for both industrial and oil field equipment and supplies.

These new stores bring to 14 the number of Republic Supply stores throughout California. Others are located at Avenal, Bakersfield, Burrel, Huntington Beach, Long Beach, Los Angeles, Newhall Ranch, Oakland (Emeryville), Santa Fe Springs, Santa Maria, Taft and Ventura.

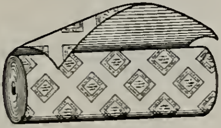
Brayton Wilbur Chosen Reserve Bank Chairman

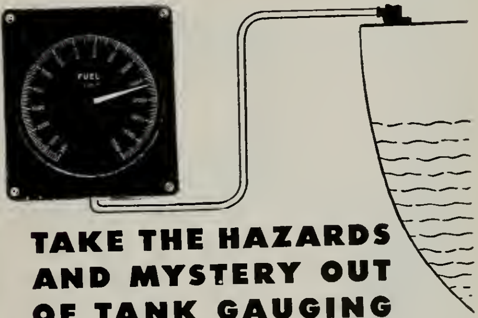
Brayton Wilbur, chairman of the Wilbur-Ellis Co., exporters and importers, and former president of the San Francisco Chamber of Commerce, has been appointed by the Board of Governors of the Federal Reserve System as chairman of the board and Federal Reserve Agent of the Federal Reserve Bank of San Francisco for the remaining portion of 1947. Wilbur has been a Class C director of the Federal Reserve Bank of San Francisco since July 5, 1944.

Wilbur succeeds Henry F. Grady, who resigned as chairman of the board and Federal Reserve agent to become the first United States Ambassador to India.

FAMILIAR SEA CAPTAINS AT MARINERS' MEETING

Captain A. T. Hunter, Captain A. T. Berry, of Army Transport, and Captain Ahmann, former skipper of famous transport "Great Northern," when Hunter was Chief Officer and Berry was a Boatswain's Mate.




FUEL

The Steamship Historical Society

(Continued from page 48)

a tribute to the pluck and seamanship of those early American sailors.

Due to cancellation of her subsidy contract after only ten years of service, the *Washington* was sold in 1858 to the California, New York and European S. S. Co. for $46,000. This was a corporation formed by some speculators, who expected to reap huge profits out of the tremendous traffic to the California gold fields.

She served for a while between New York and Nicaragua. In 1859, her owners went bankrupt, and she was laid up. Early the next year she was bought by the Pacific Mail Line and sent via Cap Horn to San Francisco. She made two or three trips to Panama and was again laid up, being too slow for the service. In 1864, she was sold to a shipbreaker and junked.

Compressed Air Tools in Workboats

(Continued from page 84)

is in another part of the yard and serves as a booster when necessary. .Air power from these compressors is distributed over 2200 feet of 3-inch line.

There are some practical considerations in running a shipyard which one doesn't always learn in an engineering school. Plant Engineer Maple finds that airlines do not disappear like extension cords frequently do when a worker has an idea for running electric current to his garage or elsewhere around his home. Another economy factor he mentioned was that a frayed airline need not be replaced for safety sake, but in the case of electric lines, safety demands immediate replacement at first sign of wear to prevent an electrical shock or damage. These economies, along with the lower upkeep cost for air-operated tools, add to their other money-making values in building workboats.

In addition to the many pneumatic tools used for grinding welds, the several chipping and other operations, along with painting and sandblasting operations mentioned, compressed air has proven to be the quick, effective way for testing boat guards, insulation space around the fish well and other compartments. The boat guard, for example, is tested for any possible leaks by soaping the weld joints and then filling the compartment with compressed air. A gage is used to control the pressure. If bubbles appear along the seams, a repair is indicated. These guards serve a dual purpose as reserve tanks. They are filled with fuel oil on the long trips of the tuna boats, which cruise as far as the Azores in search of the valuable tuna. A reliable fuel reserve can be important at distances such as that. In order to make periodic tests, a coupling is welded in the boat guard amidship which hooks on to the air hose.

National Iron Works' big structural shop does work for the shipyard and a general fabricating business as well. Here, compressed air is as widely used as in the yard. In the section of the shop working on ship fabrication, some of the applications seen are in air hoists, air-operated forging hammer and a "home-made" bulldozer.

One of the ten 2-ton motor hoists in use is shown in Fig. 6. The shop superintendent asserts that the upkeep on this type of hoist is at the minimum and the lack of overhead trolley wire clutter is another advantage.

The steam hammer in Fig. 7 might be steam-operated if the shop had steam, but no heat is required in this San Diego-located plant, so compressed air does the work. The blacksmith hammer, moreover, only is used occasionally and with compressed air, pressure is always up and ready to go to work. The operator is forging a boom band in the picture.

When a bulldozer was wanted for bending and forming structural members, the shop took an old squeeze riverter and converted it to the desired purpose as shown in Fig. 8. The compressive force obtained simply from coupling the air cylinder to a cam can be multiplied as much as ten times and gives the shop an effective tool for special jobs, one that is easily and accurately controlled and which may be applied to a variety of work.

The examples cited and the others which may be found in the modern shipyard at San Diego have helped the San Diego tuna fish industry to mark a banner year. The close of 1946 saw an all-time record catch and pack, enough to supply half the nation's tuna consumption and to raise San Diego to the position of the second richest fishing port in the country.

Admiralty Decisions

(Continued from page 61)

circumstances and, therefore, the case was dismissed. If the Dollar case or some other case were filed today against the United States, the individual members of the Maritime Commission or any other administrative body could be joined as party defendants provided all the other requisites set forth in the Act were fully met. The United States Supreme Court affirmed the decision of the United States Court of Appeals, District of Columbia, in April of this year. The United States Supreme Court repeated what the United States Court of Appeals had previously held, namely, that suit was properly against officials of the Maritime Commission because they were the people who had actual possession of the shares and the United States was not a party defendant, named or otherwise. Of course, no discussion is included within the opinion relative to the applicability of the Federal Tort Claims Act because the Act was not then before the court in its relation to the Dollar suit or otherwise. Under the new act, suit could have been filed against both the United States and the various members of the United States Maritime Commission provided that the other prequisites set forth in the act could be met. Under those circumstances, the court would not have had before it the problem of determining whether or not the United States was a party defendant, either by name or by implication, because it could be joined along with the various members of the Commission even though the United States was not a true party defendant. They could then move for dismissal and suit could continue against the various members of the Maritime Commission.

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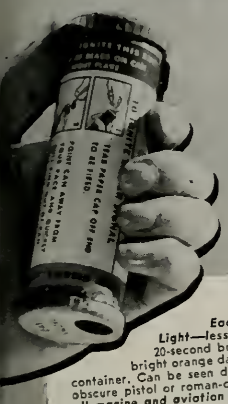

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(Continued from page 47)

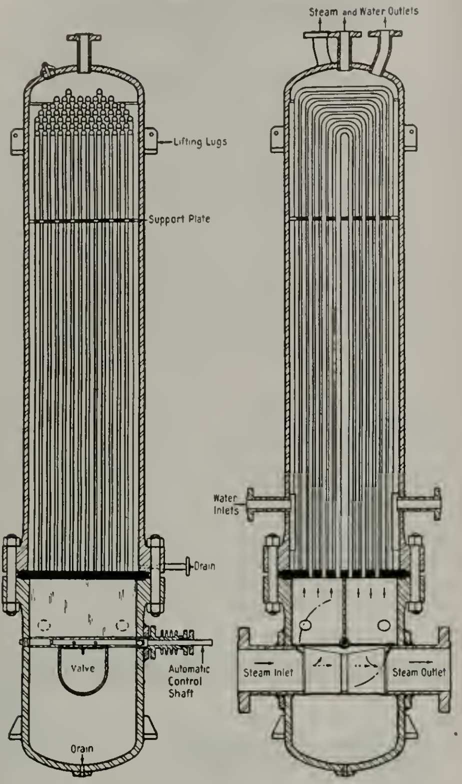


FIGURE 20

SECTION THROUGH A SHELL ATTEMPERATOR

atomic hydrogen penetrates the steel causing decarburization and intergranular disintegration.

Special Type of Corrosion Failure

Before leaving this subject we would like to call attention to a type of failure which has frequently been confused with the type of failure which we have been discussing and which was illustrated by Figure 5 to 19 inclusive.

Floor tubes differ from other generating tubes in that the hot gases are above the tubes; therefore, the top half is receiving heat and may be hotter than the lower half. Internally, if velocities are too low, steam will separate from the water and flow along the top of the tube. Tubes are best cooled by water; therefore, when they are periodically contacted by a layer of steam, the metal temperature rises and the iron-steam reaction cuts a groove into the top of the tube wall. Ultimate failure takes the form of grooving and blisters.

Examination of such a failed tube shows the groove to be filled with black oxide of iron which has penetrated the metal as shallow fingers. Deep etching and microexamination do not reveal any signs of the intergranular disintegration as noted in Fig. 13 to 18.

The metal above the groove has changed structurally from lamellar pearlite to a state of complete spheroidization, indicating that the groove was formed when the metal was at a temperature level close to 1350° F (730° C).

We have always found that the remaining metal was in the same condition as when installed, that is, it is free from the intergranular disintegration noted earlier in this paper.

(To be concluded in August Pacific Marine Review).

With the Port Engineers

(Continued from page 51)

a ship is turned over to owners, the lubrication system be inspected by competent personnel. It is not a difficult task—simply pump the lubricating oil out of the system into the settling tank; open the manhole cover of the sump tank; remove an elbow or blank flange in the lubricating system; remove an elbow from the lubricating oil cooler, take a flash light and examine the interior—you can easily and quickly see if deposits are light, heavy, or that the system is clean. If the system is clean, replace the fittings and sump tank cover and the job is done. Two men, a few hours' work, and you have peace of mind.

If the system is dirty, of course it should be flushed. Submit a sample of the oil to your oil supplier for an analysis. They will inform you of its condition.

For the expenditure of a few man hours of labor, you have protected the owners against the possibility of maintenance expense running into many thousands of dollars.

High Lights on Report of New York Harbor

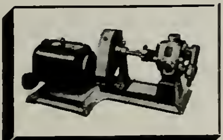
(Continued from page 40)

Self-propelled government ships, such as the LSM and the LST types cannot be used in the canal.

Opened to traffic in 1825, the Erie Canal provided relatively cheap and speedy transportation and opened up a new link to the Great Lakes and midwest areas. Communities along its route became busy trade centers. Commerce and industry developed rapidly in the territory it served. Thriving communities, such as Syracuse, Rochester, Utica, Buffalo and Albany developed rapidly. The canal became the principal route between the Atlantic Seaboard and midwest states, and the New York-New Jersey Harbor became the leading port of the United States.

In 1933, legislation was adopted stipulating that the canal system was to maintain toll-free and operated by the State for the benefits of its people by providing ade-

(Please turn to page 102)



High Lights on Report of New York Harbor

(Continued from page 100)

quate water routes as an aid to commercial and industrial growth.

Various improvements have been made to the canal through the years. In 1935, the Federal Government authorized the deepening of the channel to fourteen feet between locks, the raising of bridges to permit a twenty-foot overhead clearance above the water line, the lowering of lock sills to thirteen feet and widening of certain sections to permit greater ease and safety to navigation. Work on these improvements was suspended during the war and the rising of the bridges and lowering of lock sills has not yet been completed.

The Federal Government's recognition of the State Canal System as an important transportation artery resulted in the deepening of the Hudson River Channel between New York and Albany to a minimum depth of twenty-seven feet. This permits ocean-going vessels to dock 150 miles inland.

C-3 Conversion for Pope & Talbot

(Continued from page 35)

auxiliary steam air ejectors are Worthington, as are the ballast pumps, bilge pumps, condensate pumps, fire pumps, fire & sanitary pumps, fuel oil service and transfer pumps, lube oil pumps, and feed pumps. Pump motors are mostly Diehl and control apparatus Cutler Hammer. Fresh water pumps and motors for same are Allis-Chalmers. Piping, valves and steam whistle are from the Leslie Company while the steam siren is Foster's.

Compressors

The main air compressor is a Worthington, boilers Foster Wheeler and most of the distilling equipment for both fresh and salt water is made by Davis Engineering Corp.

Refrigeration Plant

Here the compressor is the Carrier type 7G8-LF with a capacity of 7 tons. The condenser and ice maker also are Carrier while the motors are Crocker-Wheeler.

Generators

The turbo-generator sets were made by the Murray Iron Works for the General Electric Co., as were the gears. G. E. built the 250 kw, 240 volt d.c. generators and Cummins Engine Co. furnished the emergency 60 kw diesel machine. Generator is General Motors (Delco) model 1-3661, 60 kw 120-240 volts, 1500 rpm.

Galley

The galley is located on the shelter deck forward and is equipped with two Hotpoint Electric ranges and two Hotpoint shelf broilers. Refrigerators in crew's and officer's pantries are Copeland.

The Electronic Navigator

By Leora Borders of General Electric

The *Seafarer* is the first P & T to carry passengers. All P & T ships have modernistic interiors with brushed aluminum trim on chairs, dressing and other tables in the five de luxe staterooms which consist of sitting room, bedroom and bath. But a new era opens for safe and pleasant travel through the use of electronic equipment.

The General Electric Electronic Navigator was installed aboard the *Seafarer* in San Francisco by Ets-Hokin and Galvan, who are sole agents for GE radar equipment. Charles T. Haist, Jr., marine representative of the GE Electronics Division with headquarters in San Francisco, took the overnight trip with the *Seafarer* from San Francisco to Wilmington. Captain Gustav A. Petterson, who has been with P & T for 14 years, had had no practical experience with radar before.

The *Seafarer* left San Francisco one evening at 4:30 p.m. The navigator was observed from the first, and showed the land points in the console just as if you were looking out a window. The night was moonless and visibility very limited but on the scope there appeared a large steamship, fishing boats and even a low-flying airplane. The latter was identified as a plane because of its speed. Then going out on deck, the port and starboard lights of the plane could be seen blinking.

Several other objects that were either boats lying at anchor without lights, perhaps fishing boats or skiffs, were picked up on the scope. They could not have seen these boats except on the viewing console.

At 5 a.m. the next morning there was an unusually heavy fog for about an hour and a half. The captain observed a vessel approaching them on the same course. Without changing speed, the *Seafarer's* course was changed, and not until the other vessel came alongside could it be seen!

When the *Seafarer* first got out to sea, the captain checked bearings with the radar picture. He could get the same bearings with the navigator that he could by visual bearing indicator (i.e.—compass and peep-sight).

On this moonless night, land points 30 miles to the rear—or 30 miles ahead could be seen. They got a beautiful picture of Monterey Bay with its deep indentation; picked up famous land points such as Pigeon Point where the Boston Clipper was wrecked almost a century ago and gave its name to the dangerous shoals; Point Sur, Point Conception,—danger points on the ocean trail.

On the approach to San Pedro Harbor's breakwaters Catalina Island 20 miles away appeared in the scope; also the marker buoys. After switching down to the 6 mile scale for entering the harbor, the 2-mile scale was used for observing the channel right to Wilmington's piers.

P & T intend to purchase radar for all their vessels —which means six C-3 types and 1 Victory ship. They intend to operate these vessels 200-300 miles up the river from Buenos Aires to the ports of Rosario and Santa Fe. It is expected that radar will easily pay for itself as it costs from $1000 to $1200 dollars a day to hold up a vessel for fog. In certain ports they just cannot navigate in thick fog (such as Gray's Harbor, Coos Bay, etc.), but now with radar the ships wil be able to *get in* and *get out.*

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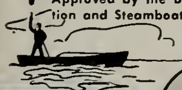

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THE SEA-AIR ISSUE

(Continued from page 72)

to enactment of the 1938 Civil Aeronautics Act contained no hint of such congressional intent. Indeed, the record is quite clear that the sponsors of the Act assured the House Merchant Marine and Fisheries Committee that shipping companies, in the administration of the act and in the award of overseas route certificates, would receive equal treatment with any other applicants:

Hence it came as a good deal of a shock when the Civil Aeronautics Board began throwing out the steamship company applicants, one by one on one pretext or another, until finally in about 1944 it became perfectly apparent to the most credulous soul that steamship companies were persona non grata simply because they ran steamships.

To date, not a single steamship company application has been granted by the Civil Aeronautics Board. Every application to come before the Board has been denied. The circumstances of each shipping company in its own field differ from those of every other shipping company in other fields, as you gentlemen well know. No one argues, so far as I am aware, that every steamship company should arbitrarily be granted the right to use aircraft. But it is a curious thing that, of all the steamship companies applying for overseas air certificates, the Civil Aeronautics Board hasn't been able to find a single one with which it would favor a certificate—even where no domestic airline wanted the route, even where no service had ever existed by air, even where no request for mail compensation was involved.

Consider two instances, and for them let's go across to the Atlantic. Back in 1940, Waterman Steamship Corporation asked permission to operate air service between New Orleans and Puerto Rico. For six long years that case dragged on the Civil Aeronautics Board's docket. Then what happened? The Board rejected Waterman and handed the route over to Chicago & Southern Air Lines. That was about a year ago. Chicago & Southern hasn't started the service yet. Chicago & Southern is a domestic airline with no previous interest in developing trade between the mainland and Puerto Rico. Development of this trade was one of Waterman's primary interests. But by the Board's action, Puerto Rico from 1940 to date has been denied any scheduled service by air over this route.

Take another case. Seas Shipping Company is up against stiff foreign competition in its shipping services to South Africa. Its foreign competitors can offer shippers a complete package of surface and air transportation. Seas sought to hold its business by meeting the competition on even terms. It applied for the right to run air service from the U. S. to South Africa. The Civil Aeronautics Board threw Seas Shipping Company overboard and gave the route to Pan American. Pan American hasn't started the service yet. So Seas Shipping chartered some air equipment from another steamship company and started operating a non-scheduled service—just to have something moving between the Atlantic Coast and Africa for the convenience of its customers.

To most of the shipping companies which seek the right to use aircraft in conjunction with their surface vessels, the question of foreign competition is vital. As of April 3, 1947, the United States Government had granted 33 permits to 19 different airlines of 15 different countries, to come into this country over routes which, by and large, parallel shipping routes. Twenty companies in 14 other countries had applications pending. The foreign air carriers, present and prospective, present a serious challenge to our national trade and commerce. Many of these foreign airline companies are owned or effectively controlled by foreign steamship interests. They are in position to offer the customer—the same customer for whose business our own American-flag steamship companies are competing—a complete transportation service while our own people are forced to stand by with an incomplete line of goods.

The Civil Aeronautics Board, in rejecting the applications of the shipping companies, hangs its hat upon its own interpretation of the language of the 1938 Act. This interpretation has been challenged time and again by members of Congress, and even the Chairman of the Board recently told a Congressional Committee that his four colleagues, who constitute a majority, were wrong. In any event, the corrective appears to be an amendment to the Act itself, to make it perfectly clear that the Board majority's construction is erroneous.

This leads into technicalities and legal verbiage which there is no point in discussing here. But it is encouraging that this spring, for the first time, the Sea-Air Committee was granted a full-dress hearing by the House Interstate Commerce Committee in an atmosphere of friendly and serious consideration. Predictions are perilous, but there is reason to believe that the shipping companies have a 50-50 chance of a favorable report from the Interstate Commerce Committee before the end of the current session of Congress. It is also encouraging to note that the House Merchant Marine and Fisheries Committee is, so far as we can ascertain, unanimously in favor of the shipping company position. The Interstate Commerce Committee has original jurisdiction over the legislation, however, since it holds legislative jurisdiction over aeronautics subjects.

When and under what circumstances there can be consideration of Sea-Air legislation on the floor of the House depends, first, upon the issuance of a favorable report by the Interstate Commerce Committee, and second upon whether we can squeeze into the crowded calendar of the House. As important as the subject is to the passenger lines, there are a few other questions before Congress such as taxes, universal training, foreign policy and the like, and we must keep a perspective upon our own chances.

AUGUST 1947

Pacific MARINE REVIEW

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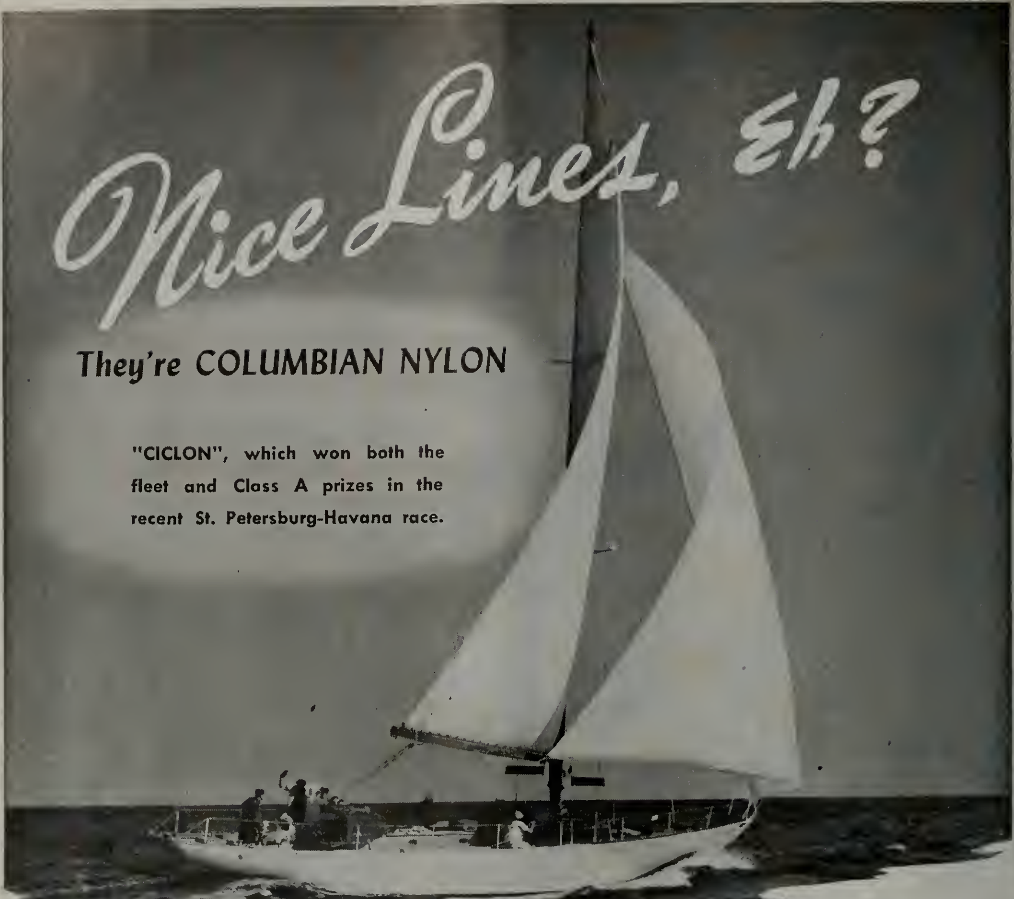

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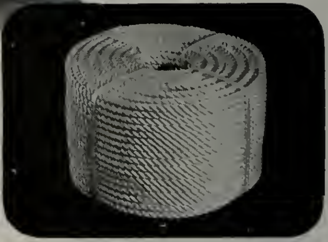

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Pacific MARINE REVIEW

TIME FOR REALISM

IT IS SAID THAT HISTORY is the record of important decisions of men. Business history may also be so defined. Decisions of today will extend onward through the years.

There are many decisions to be made now, and their ultimate effect should not be overlooked. The maritime industry, with centuries behind it and centuries ahead of it, needs the sound judgment of men who can relate business prosperity to the nation's security, and at the same time overcome the inertia with which too much government control has afflicted it. There is something to the opinion that business men should be thankful they don't get all the government they pay for, but there are some things the government should do, and the industry is entitled to know what is going to happen from day to day. The Maritime Commission has certain prerogatives and duties under the Act which created it. It should exercise the prerogatives and perform the duties, and not permit itself to be batted around by the ICC and the CAB and Congressional committees and bureau chiefs and assistant presidents, etc., etc.

The Interstate Commerce Commission has definite duties, and one of them is *not* the stalling and delaying of hearings for *eighteen months* when vital American interests are at stake, and permitting favored transportation interests to undermine competition out of business. The Transportation Act of 1920 requires the Commission to make rates *reasonable.* They are not reasonable. Why 18 months for a *hearing?*

The Civil Aeronautices Board not only sets up barriers of its own to American shipping but permits foreign shipping interests to perform services which it forbids to Americans. We wonder if Admiral Land still remembers his "First Commandment" recited at the Merchant Marine Conference of 1945—"No inhibitions and no prohibitions by statute between ocean air and ocean ship." That was before (71 days before) he became associated with air operations.

One of the almost infinite number of things on which George Washington was right was shipping. He told Congress "We should not overlook the tendency of war to abridge the means, and thereby at least enhance the price, of transporting goods to their proper markets. I recommend it to your serious reflections how far and in what mode it may be expedient to guard against embarrassment from these contingencies by such encouragement to our own navigation as will render our commerce and agriculture less dependent on foreign bottoms which may fail us in the very moments most interesting to both these great objects . . . There can be no greater error than to expect or calculate upon real favors from nation to nation. It is an illusion which experience must cure." Congress still needs to be told. And the country needs to be told such things as:

That subsidies are not a loss;

That there should be no cessation of shipbuilding;

That the Panama Canal should be free to American intercoastal ships;

That everything that happens in the Orient affects us;

That Hawaii and Alaska are parts of the United States and should be protected in their economy.

That Army and Navy establishments in our port cities are great assets, and should not be harrassed; and

That the maritime industry is national defense as well as an economic necessity. It should be given every encouragement.

* * *

"There is no limit to the good a man can do if he doesn't care who gets the credit."

CHINOOK

OF PUGET SOUND

FROM TIME TO TIME during the past four decades it has been the privilege of the Pacific Marine Review to record the progress of the Puget Sound Navigation Co., and its Black Ball Line, which plies the blue waters of Puget Sound in regular service between Olympia, Tacoma, Seattle and Victoria. The years have seen famous vessels come and go in this service; well remembered are the *Rosalie*, the *Clallam*, the *City of Bremerton*, the *Indianapolis*, the *Sol Duc*, the *Chippewa*, the *Iroquois*, and many others, two of which are pictured on page 58 of this issue. There are now 23 vessels in the Puget Sound Navigation Co's. fleet, whose Black Ball house flag dates back to 1816 and is the oldest house flag in the American Merchant Marine.

In the February issue there was announced the keel-laying of "the most modern and most lavishly equipped vessel for automobile-passenger service yet built in America"—the *Chinook*. The *Chinook* was launched April 22 and christened by Mrs. Alexander M. Peabody.

Successful trial runs were held on June 15, with maiden voyage on June 25.

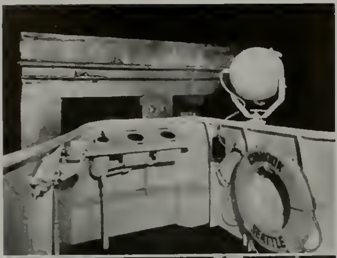
Designed by Gibbs & Cox and built at Todd's Seattle yard, the "Queen Elizabeth of the Inland Seas" is easily the finest vessel ever put into Sound service.

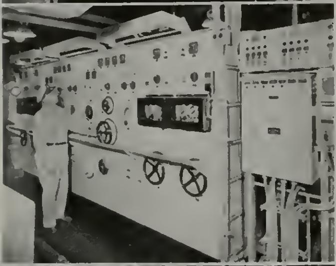
The *Chinook,* 318 feet long, has accommodations for approximately 1000 passengers and sleeping accommodations for 208 persons in its 100 staterooms. All staterooms are equipped with air-conditioning, hot and cold running water, toilets, and bed (no berths). One hundred automobiles can be carried with ease on the spacious car deck.

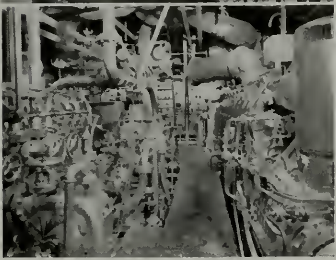
There are public rooms in abundance, a large semi-circular dining salon, coffee shop and wide deck areas. No cost has been spared in decorating and furnishing, making the *Chinook* comparable to the finest hotel in comfort and feeling of welcome to the traveler. Fresh, light colors predominate, with modified modern furnishings throughout.

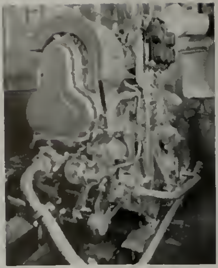
Keyed to the modern trend in steamlined transportation, the complete furnishing and decorating of the *Chinook* was handled by Frederick & Nelson, Seattle division of Marshall Field & Company. The job was coordinated and supervised by Robert H. Blume of the Frederick & Nelson studio of interior design and contract departments. Frederick & Nelson decorators spent eight months planning and executing the interior color

First row, from left to right: Garden lounge, showing Formica Realwood table tops; Corridor on Promenade Deck, inboard (left side) bulkheead of steel, ceiling Marinite, standard base; outboard bulkhead (right), Marinite marine veneer, painted; Salon and Companionway to Promenade Deck staterooms: Marinite marine veneer faced, painted; Soffits plain (standard base finish).
Second row, from left to right: Lobby, Customs Office, Purser's Office and Gift Shop Marinite on the soffits only with standard base finish; the Promenade Deck, showing Welin davits and lifeboat; the Bridal Suite, bulkhead and soffit, Marinite plain—the finish is a filler of zinc chromate and two finish coats of Du Pont synthetic gloss. Good example of fireproof draperiees. Simmons supplied mattresses, chairs and tables in the staterooms.
Third row, left to right: Main Dining Salon, showing Formica table tops; New Pullman type combolet; De Luxe Stateroom, showing the same features as described above.









Top, left: Bridge wing, showing engine position indicators, which relay positions back to bridge. Background structure is the end of the pier.

Main control panel.

Main engine room, looking aft on center line. (Five pumps on center line.)

Above, center: Emergency generator engine for lights and ship's power.

Top, right: Pilot house, looking starboard to port.

View of the car deck.
Main engine room, looking forward.

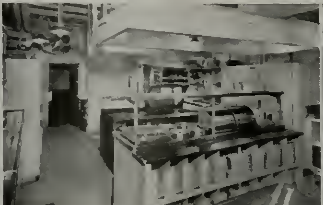
schemes and furnishings, and the *Chinook* is the first ship of its type ever to be completely decorated and furnished by a Seattle firm.

All seating furniture was custom-made to Frederick & Nelson specifications by a Seattle firm, Tri-Way Metals Industry. Frames are of tubular aluminum and the furniture is double-stuffed on springs and webbing, covered by foam rubber over which mohairs, in nubby weaves, and in varying colors, have been applied to carry through an artistic decorative plan that blends with the interior of each room. Flooring throughout the ship, of marbelized rubber tile, also was made up especially for the *Chinook* installation.

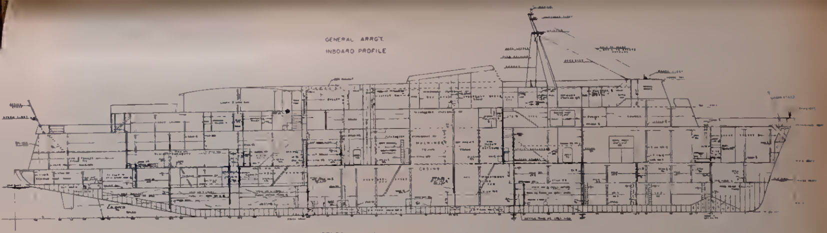
The tubular furniture and bed springs have been treated to prevent reaction to salt water, and all painting, decoration and furnishings of the ship have also been especially treated as protection against fire, mildew, fading, and salt spray.

Marinite

The *Chinook* is an outstanding example of the way in which fireproofing and acoustical materials can be built into a vessel with beautifying results. There is hardly

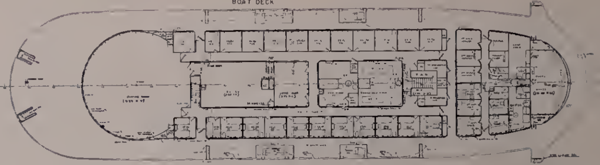


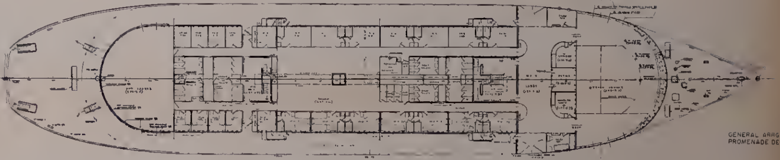
Left to right: Crew's recreation room. Galley, looking forward from dining salon entrance, showing Hotpoint range. Galley, looking toward entrance to dining salon.



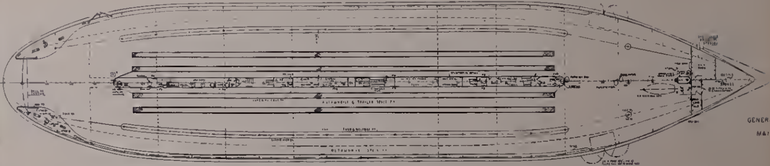
GENERAL ARRG'T
INBOARD PROFILE

GENERAL ARRG'T
BOAT DECK

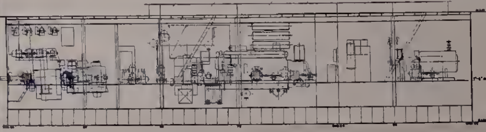




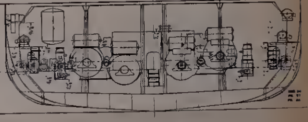
GENERAL ARRG'T
PROMENADE DECK



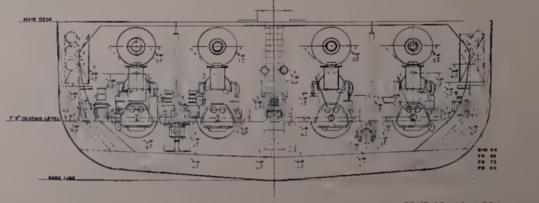
GENERAL ARRG'T
MAIN DECK



ELEVATION AT CENTER LINE LOOKING TO PORT



SECTION AT BHD 64 LOOKING FORD



SECTION AT BHD 64 LOOKING AFT

ARRG'T OF MACHINERY

a room or section of the ship where Johns-Manville's Marinite has not been utilized to give a decorative appearance combined with incombustibility. It has the further advantages of light weight, high strength, and low maintenance cost, and the Todd Shipyard joiners have worked these practical functions into a finished job that compares favorably with that of the finest hotel.

Many of the photographs herewith show Marinite in one form or another, as indicated in the captions. There is a total of 14,556 sq. ft. of Marinite on the ship.

Furnishings

Leaving the lobby, passage ways lead toward the staterooms on the promenade deck. In this group of staterooms there are 14 de luxe staterooms accommodating two people, the walls of which are carried through in a calla lily green. The draperies of salmon hue, on the windows contrast the walls in color and the floors are carried through in a cocoa brown. Each of the de luxe staterooms is equipped with a Crane Co. comboler, a Simmons armchair and a Simmons dressing table together with grip stands and all necessary accommodations for travel comfort. All beds have Simmons Marine Beautyrest mattresses and the bedspreads are attractive in their display of salmon tone which adds to the interesting effect of these rooms. On each dressing table is a large lamp in lucite and aluminum with plastile shade. Other staterooms on the promenade deck have been furnished in the same interesting color scheme.

Passengers will be delighted with the lavish salon in the center of the ship, decorated and furnished in rose-beige, floors in gray-rose. Occasional chairs in tones of rose green, walnut and yellow hues creating a most satisfying color scheme. Foam rubber gives added comfort to the furniture and the entirely double stuffed frames of all pieces is an indication of the care with which details have been studied. Between the stanchions in the salon is a large, hand-carved lucite map showing the topographical details of Puget Sound and the territories served by the Puget Sound Navigation Company.

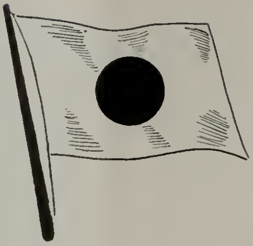
The after lounge is done in mulberry with the floors in cocoa rubber tile. Draperies in glass cloth of figured materials, are carried out in tones of greys, chartreuse, and deep violet tones. The furniture is covered in deep magentas, turquoise blues, yellows and grays. All furniture in the lounge is arranged to make conversational groupings and all banquettes which are used in this room are placed for the comfort of the traveler who easily can view the ever-changing scenery through the large plate glass windows. Furniture frames throughout are in amadolized aluminum and all filled with foam rubber to appeal to the most critical person.

Forward is the Garden Lounge. In this room the walls are of turquoise blue with white screens along the window perforary where flower boxes with growing plants add to the attraction of this lounge. The furniture is a series of tile terra cotta tones, turquoise blue, walnut, gray and yellow hues. The unique method of decoration employed in the use of standing screens, together with the connecting valances, which are carried through in extruded material, enhances the beauty of the Garden Lounge. Both the forward lounge and the after lounge

PARTICULARS		
LENGTH, overall		318.2′
LENGTH, water line		300′
BEAM, molded		53′
BEAM, overall		65.8′
DEPTH TO MAIN DECK		20′
DRAFT	Mean	13.0′
	Forward	11 - 9½″
	Aft	14 - 2½″
AUTOMOBILE CAPACITY		100 cars
PASSENGER CAPACITY		900 persons
PROPULSION		twin-screw
PROPULSION POWER		Total 4800 shp.
SERVICE SPEED		18.5 knots

The new Flagship of the Puget Sound Navigation Company, (The Black Ball Line), M. V. "Chinook" on her maiden voyage from Puget Sound Navigation Company's Colman Ferry Terminal, Seattle, for the new terminal at Victoria, British Columbia.

Alexander M. Peabody, president of Puget Sound Navigation Company of Seattle.



George H. Lent, one of the directors of company and one of founders of Black Ball Line and Alaska Steamship Company.

are furnished with card tables and comfortable chairs, in addition to the overstuffed furniture.

Beautiful staterooms on the boat deck are decorated with salmon walls and draperies in gray-green. The beds all have inner spring mattresses and are covered with bedspreads in the same green tone which predominates in the draperies. All these staterooms are equipped with Crane Co. combolets and dressing tables with mirrors. Here again the mattresses, chairs, dressing tables, night tables, and grip stands are by Simmons.

Near these staterooms is the coffee shop, or "quickie" dining salon, in which passengers will be served coffee, sandwiches and pastries from electric equipment. The coffee shop has chartreuse walls and a vermilion red ceiling from which port lights illuminate the service counter. The counter top is carried out in vermilion red with the face of the counter in a chartreuse leather. The seats before the counter are stools with upholstered tops covered in vermilion red. Draperies at the windows are made in widths to cover completely the windows which lead to the passage ways. This material is of glass cloth in pattern colors of chartreuse and vermilion red.

Near the coffee shop is located the dining salon, seating 108 persons. The salon is a giant semi-circle room where view has been given every attention. The entire perforary of this room is a series of large plate glass windows so that the view outward is not interfered with at any time. Under this perforary of windows are large upholstered seats in dove gray which accommodate the diner, tables and chairs being placed in front of the seats which carry through throughout the perforary of the room. The walls of the dining room are carried out in dove gray. The ceiling, which is a spider web of beams, forms a rosette in the center of the room. The floors are carried through in an azure blue of rubber tile. The draperies are in yellow glass cloth in patterns of yellow, blue and white. All the dining room chairs have fully upholstered backs and seats for the comfort of the passenger. Chairs are filled with foam rubber and covered in an azure blue striped mohair. This salon has been decorated and furnished to give the passenger every opportunity for relaxation during meal time.

There are 50 staterooms on the cabin deck. These rooms have been carried through in butter yellow with draperies before the port holes of gray and yellow stripes. Floors are in brown to complement the yellow and the beds all have inner spring mattresses and are covered with colorful bedspreads. All these staterooms, too, are equipped with Crane combolets. But when you say "Beautyrest," little more need be said about a stateroom.

Beneath the car deck, the last word in marine engineering is immediately in evidence. The main propulsion power plant in the *Chinook* is diesel electric, consisting of four General Motors diesel engines, 16 cylinders each, Model 278-A, driving four Allis-Chalmers MHC direct current generators. Starting air compressors are Ingersoll Rand. These in turn drive four Westinghouse motors which operate in pairs to two main shafts through Farrel-Birmingham reduction gears. The motors rated 1128 hp, 490 volts d.c., totally enclosed, self-ventilating. Each of the two shafts transmit 2400 hp at 310 rpm. The propellers are 8′-6″ diameter of manganese bronze, three blades, made by the Coolidge Propeller Company, Seattle. There are six Welin lifeboats, with Welin davits and winches.

In the auxiliary engine room are two ship's service Westinghouse 200 kw generators driven by General Motors diesels 8 cylinders each, Model 268-A, furnishing power for all the auxiliary machinery, lighting, cooking, radar and radio. Heating of the vessel is by steam furnished by two Cyclotherm boilers made by the Ames Iron Works division of General Furnace Corporation.

Purifiers for diesel and lubricating oils are by Sharples

Corp. In addition to the regular ship's service generator there is an emergency generator of 100 kw capacity located on the boat deck. This generator, made by the Century Electric Company, is driven by a three cylinder General Motors diesel engine, arranged to start automatically if power from the regular generators should fail. The emergency generator provides power for emergency lighting, radar, radio, steering, water tight doors and telephone. Walter Kidde Co. furnished CO_2 equipment.

The ship is provided with navigational radar made by Raytheon and has a radius of 50 miles. Radio apparatus is a 50 watt ship-to-shore telephone made by Northern Radio Company, type No. 385-A.

The steering gear is electric hydraulic. The steering wheel in the pilot house transmits power through an electric circuit and two helms motors to the control apparatus on the steering engine. There is an emergency steering station on the boat deck aft which is connected mechanically to the steering engines for use in case of failure of the electric circuit. The steering engine has two electric motors, only one of which is in use at one time. The motors control the twin spade type, steel-welded rudders of 33 sq. ft. area through hydraulic pumps and rams. The twin rudders are directly aft of the propellers thus providing accurate and responsive steering. Anchor is Stockless type with 105 fathoms 1⅛" Dilock chain. Hyde Windlass Co. made the anchor windlass.

Mooring

Due to the unusual design and size of the *Chinook* and to the conditions of docking encountered in Victoria, B. C., special consideration had to be given her mooring facilities. To meet these conditions and require but a minimum of deck space, two Markey type CEW 7½ hp warping capstans are mounted on the after deck. Manufactured by the Markey Machinery Company, Inc. of Seattle, these capstans heads are designed to handle 5" circumference hawsers with a line pull of 5000 lbs. at a speed of 30 feet per minute. Controls are reversing, push button operated, 440 volt, 3 phase, 60 cycle.

Ventilation—Cooking

All passenger and crew spaces on the *Chinook* are ventilated with electrically driven fans located in the fan room on the boat deck. There are automatically controlled heaters in the ventilation ducts for heating the vessel. The engine rooms have forced ventilation without heaters.

At the left: R. J. Lamont, vice president of Todd Shipyards Corporation, where Chinook was built.
At the right: I. D. Birse, general freight and passenger agent, Puget Sound Navigation Co.

The galley is all electric, including Hotpoint ranges. Toasters, refrigerators, dish washers and vegetable peelers are all electric. Galley stores are moved to the galley from the car deck by an electrically operated dumb waiter. There is a second dumb waiter from the galley to the crews' mess room, assuring food for the crew in the same hot, tasty, form as will be enjoyed by passengers in the main dining salon.

Bunker capacity is 63,710 gallons of fuel oil and 29,500 gallons of fresh water.

Responsible for the outstanding position of the Puget Sound Navigation Company in the shipping world are the following officers and directors:

Officers: Alex M. Peabody, president; C. F. Lonergan, vice president in charge of traffic; H. I. Anderson, vice president, in charge of operations; H. C. Strassburger, secretary-treasurer; E. W. Peabody, marine superintendent; Neil J. McCullough, superintendent, maintenance and repairs.

Board of Directors include Lawrence Bogle, chairman, H. C. Strassburger, secretary, J. E. Blodel, George H. Lent, L. B. Peabody, Alex M. Peabody, H. I. Anderson and C. R. Lonergan.

From left to right: Neil J. McCullough, superintendent of Maintenance & Repairs, Puget Sound Navigation Company, Captain Lyle Fowler, master of Chinook, and Erling Nilsen, chief engineer of the Chinook.

VARIABLE PITCH PROPELLERS

WITH THE VISIT OF THE JOHNSON LINE'S MOTORSHIP SUECIA to the West Coast during July, one of the most promising new developments in marine propulsion came back into the news. Attention was called to this feature in an editorial in Pacific Marine Review in August 1946.

The *Suecia* is a twin screw vessel of 7400 tons completed in 1944, and is equipped with twin KaMeWa propellers 14 ft. 10 inches in diameter, giving 3500 bhp at 125 rpm, for a total of 7000 hp. These are the largest variable pitch propellers in the world.

A control pillar on the Captain's bridge can contain all the devices necessary for operating the propellers and the engine.

For adjusting the pitch of the screw there is a lever connected mechanically to the operating gear on the propeller shaft. By the simple movement of this lever the propeller blades can be set for any required pitch between full ahead and full astern. For going ahead, the handle is moved forward from the neutral position and, for going astern, it is moved backwards. Thus, mistakes are most unlikely to be made. Every position of the handle corresponds to a certain pitch of the screw and it cannot be moved faster than the propeller blades will turn. Thus, one can check on the bridge that everything is functioning correctly, which arrangement gives the captain the confident feeling that he has full control of the machinery and of the ship. Adjustment of the propeller from full-speed ahead to full-speed astern is effected in 5 to 15 seconds, depending on the size of the propeller. However, one can stop in the shortest time by pausing several seconds at the propeller setting—5°—and then slowly going to full astern.

For controlling the engine the equipment includes a tachometer, push buttons for adjusting the speed, a switch for emergency stopping of the engine, and a push button for signalling to the engine room.

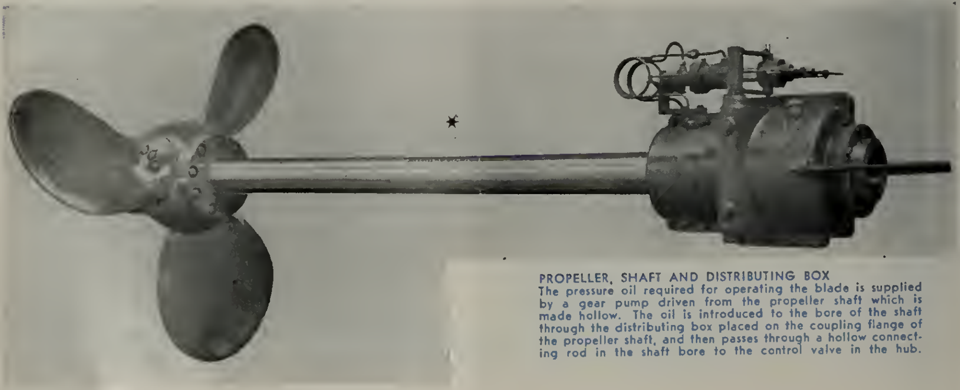
The speed altering device is used: 1 fthe vessel is required to proceed at slow speed for a considerable time, because it is then more economical to run the engine at a lower speed; When extra speed is required, the propeller pitch then being reduced so that the engine revolutions can be increased above normal. In this way more power is developed by the engine without overloading; for adjusting the speed to avoid vibration; if the distance between the bridge and the engine is small, the speed altering device can be a purely mechanical arrangement of hand wheel, sprockets with chains, etc.

The switch is used when the engine is to be stopped at the end of the voyage or if there is a risk that a wire, towline, etc. may foul the propeller.

The push button for signalling enables the order to be given to start the engine—or, alternatively, the propeller can be controlled by the engine room staff in response to telegraph signals in the normal way.

Motorships

It is claimed by the manufacturer that this propeller has the following advantages for motorships in general: Maneuverability superior to that of any system with fixed bladed propeller;



PROPELLER, SHAFT AND DISTRIBUTING BOX
The pressure oil required for operating the blade is supplied by a gear pump driven from the propeller shaft which is made hollow. The oil is introduced to the bore of the shaft through the distributing box placed on the coupling flange of the propeller shaft, and then passes through a hollow connecting rod in the shaft bore to the control valve in the hub.

The speed of the ship can be kept at any value down to zero;

In harbors, canals and locks, and when navigating in fog the ship can be given a moderate speed, whereas the engine runs at full speed always ready to develop its full output;

All propeller and other adjustments can be made by the navigating officer on the bridge, when mistakes are practically out of the question or can be noted and corrected before anything untoward happens.

Carbonization and wear of the engine are reduced* as also the risk of cracked cylinders since the engine does not have to be reversed and the stops and starts are reduced to a minimum; hence, lower costs for maintenance and depreciation;

The engine can be run at full speed and thus its full power utilized under all conditions, both when the vessel is loaded, or light, or towing, or icebreaking;

Greater possibilities for forcing the ship (by increasing the revolutions);

Speed where vibrations occur can be avoided more readily;

The engine can be simpler and air compressor equipment smaller. The number of maneuvering operations is no longer limited b ythe amount of air in the container;

By setting the blades in the zero position the engine can be tested with full speed while moored at the pier;

By using an ordinary speed governor instead of an overspeed governor, more stable running is obtained in rough seas. (No racing of the propeller.)

Tugboats

As the speed of the ship can be varied simply and immediately over its whole range, the towline can be tautened without jerks and, during towing, the speed can be altered with a minimum of adjustment to the engine.

Quicker and surer maneuvering because the control is direct from the bridge and the engineer is not tied to the operating gear but has plenty of time to attend to the machinery.

Both when towing and when travelling free the propeller pitch can be adjusted so that the full speed and thus the full power of the engine can be utilized. Therefore,

(Please turn to page 104)

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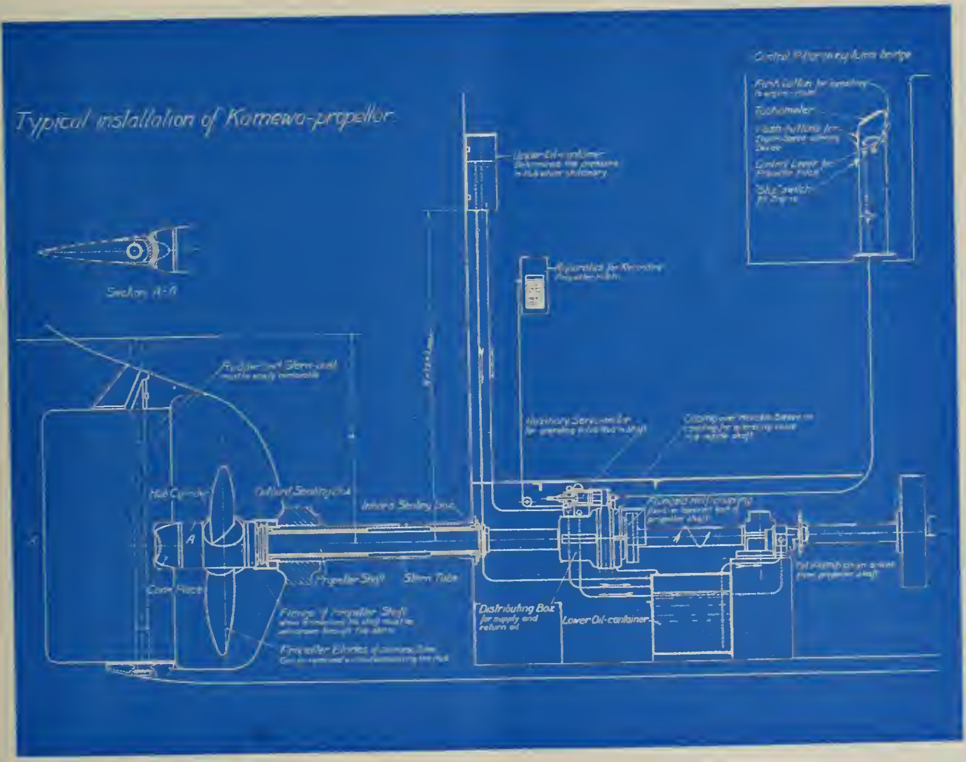
* Examination of English statistics shows that, with large diesel engines, every starting up increases the wear equal to about 16 hours running. Motor experts on this aspect have found that there is even greater wear of the cylinders while maneuvering in and out of the long approaches to certain harbors than during the whole journey across the Atlantic.



TURBINE-ELECTRIC PROPULSION ON CLEVELAND AND WILSON

By HUGHES W. OGILVIE, sales engineer with
General Electric's Federal & Marine Section.

EDITOR'S NOTE: On June 30 the Northern California Section of Naval Architects and Marine Engineers heard a very well prepared paper on Turbine-Electric Equipment. Part of the paper is published herein and the remainder, together with prepared discussion from the floor, will appear in the September issue.

President William Warren very ably conducted the meeting of the Section which was the first under the following officers: President, William Warren, of American Bureau of Ships; Vice President, H. P. Champlain, of United Fruit Co.; Secretary, Lester White, of Matson Navigation Co.

THE NEW TRANSPACIFIC LINERS, the *President Cleveland* and the *President Wilson,* will be ships of which every American can be proud. These ships combine not only luxuriousness, safety, comfort, and recreational facilities in the passenger quarters, but also many interesting engineering developments in the engine rooms. This combination is setting a new standard in marine transportation.

The technical side of the picture is a little more difficult to depict than is the artistic, for it touches almost every field of modern engineering.

The power plants, which furnish power for driving the ship, and for auxiliary purposes are comparable in size to many land central stations.

Turbine-Electric Propulsion Equipment

The turbine-electric propulsion equipment on each of the new vessels consists of two turbine-driven, alternating-current generators, each normally rated 6890 kw, 3600 rpm, 3500 volts, 3 phase, 60 cycles, 1.0 power factor. However, each of these sets has a continuous maximum rating of 7650 kw at 3610 volts and 3715 rpm.

The steam conditions at the turbine throttle are normally 590 lb. gage pressure and 815 F total temperature with an allowable maximum of 600 lb. gage and 850 F total temperature. The turbines are designed for 28.75 in. vacuum referred to a 30-inch barometer.

The propelling motors, which are of the synchronous types, are each normally rated 9000 shaft-hp at 120 rpm, and 10,000 shaft-hp maximum at 124 rpm. These motors may be operated at 110 per cent of normal speed, provided the normal rated horsepower is not exceeded.

Each turbine-generator supplies power to an individual propelling motor under normal operating conditions. Cross-over connections are provided, however, for driving both propelling motors in parallel from either turbine-generator at reduced powers and speeds.

The turbines are 14-stage impulse machines and automatically speed-governed by means of a hydraulic follow-up after the speed lever on the operating panel has been moved to the desired position.

Three extraction steam openings are provided in the turbine casing for supplying steam for heating the feed water in three steps to a final temperature of 310 F, for evaporator use, and for miscellaneous heating purposes.

The turbine rotors, including wheels and shaft, are milled from solid steel forgings.

The generators are of the totally enclosed type with water coolers installed inside of the casing for taking the heat out of the re-circulating air.

The synchronous propelling motors are totally enclosed like the generators and cooled by the same method. The motors are 60-pole machines and have a speed ratio between generator and motor of 30:1. Squirrel-cage windings are imbedded in the rotor poles for bringing the motors up to near synchronous speed before applying current to the rotor field poles.

Provision has been made for using the motors as generators during crash reversals from top speeds ahead. The energy so generated is absorbed in a bank of resistors. The P-2 types of transports are the first modern turbine-electric propelled ships to make use of dynamic braking for absorbing the stored energy of a fast-moving hull to slow down rapidly.

Auxiliary Turbine-Generator Sets

Two turbine-driven auxiliary power generating sets are installed in each engine room. The turbines are of the high-speed, compact, efficient Naval type, each operating at a speed of 10,033 rpm and geared through a single-reduction gear to give an output speed of 1200 rpm at the generator shaft.

Three generators are driven in tandem by each turbine-gear unit. The ratings of the generators and their uses are as follows:

1—500 kw, 6 pole, 0.8 pf., 450 volt, 60 cycle, 3 phase, 1200 rpm, totally enclosed, water-cooled, alternating-current generator, for furnishing practically all auxiliary power aboard ship.

1—20 kw, 6 pole, 120/240 volt, 3-wire, 1200 rpm, direct-current generator, for furnishing excitation to the main propulsion generator and motor fields, and power for the forced-draft blowers.

1—750 ampere (momentary), 100 volt, 6 pole, 1200 rpm, direct-current booster exciter. This booster exciter is used when operating the synchronous motor on its squirrel-cage winding, and also serves to maintain constant volts per cycle during high intermittent torque demands of the motor.

The 200 kw direct-current generator is used in port for furnishing current to the deck auxiliaries, such as: anchor windlass, capstan, and cargo winches. This avoids duplication of power generating equipment for port use.

The auxiliary turbines are six-stage machines, designed to operate under normal steam conditions of 575 lb. gage pressure, 815 F total temperature at the throttle, and 28.75 in. vacuum at the exhaust flange. The turbine rotors consisting of shaft and wheels are machined from solid steel forgings the same as the main propulsion units. The efficiency of the units is very high, the steam consumption being only 10.6 lb. per kw-hr under rated load conditions.

The 500 kw ac generators are totally enclosed with water coolers situated in the top half of the casings. The direct-current machines are furnished with drip-proof covers.

The large generators are totally enclosed in casings where the temperatures can be controlled. This prevents such generators being used for vacuum cleaners and the plugging up of ventilating ducts in the cores by dust and oily vapor sludge formations.

The main power is transmitted to the propeller shaft by magnetic attraction across air gaps where there is nothing to wear out. Vibrations are dampened by the amortisseur windings on the motor and thereby prevented from being transmitted to the prime movers. Almost 80 per cent of ship's speed can be attained with one engine room shut down.

PART II

Dynamic Braking Control

This section of the paper deals with the control changes which were made on the P-2 types of ships to effect speedy crash reversals from normal and maximum speeds ahead to reverse in the shortest possible length of time. The ability to make such reversals is one of the requirements on all Naval vessels. In merchant ship service, however, an operation of this nature is seldom, if ever, required, as ships ordinarily slow down before entering harbors. The additions which were made in the control apparatus on the P-2 ships may therefore be considered more in the light of "added emergency" features, as the measures applied do not concern reversals from ship speeds below 85 per cent speed.

The problem of crash reversals from top speeds include such factors as: the initial speed and weight of the ship which is a measure of its stored energy; the propeller efficiency and its torque characteristics when being driven as a water turbine by the ships momentum; and the ability of the propulsion power plant to rapidly absorb the stored energy in the moving hull by applying a counter torque to the propeller, thereby bringing the ship to rest.

The P-2 ships have a displacement weight of 21,900 tons, a normal rated speed of 21.0 knots and a maximum rated speed of 21.7 knots.

There are two methods by which a propelling motor of the synchronous type with squirrel cage starting winding can be used to apply a counter torque to the propeller

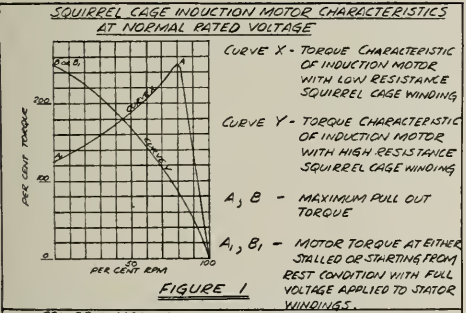


FIGURE 1

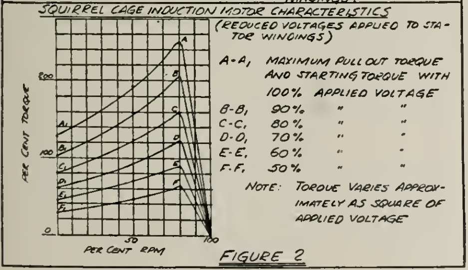


FIGURE 2

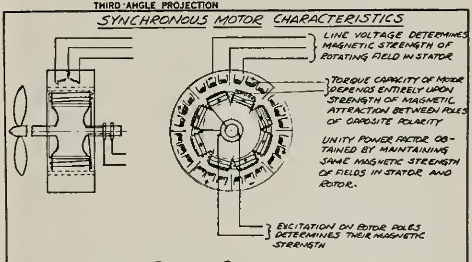


FIGURE 3

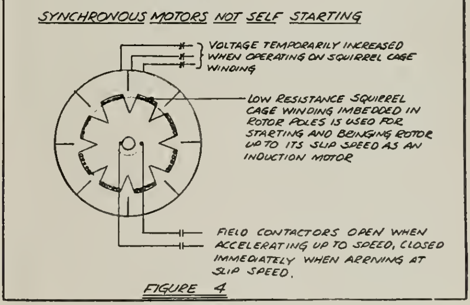
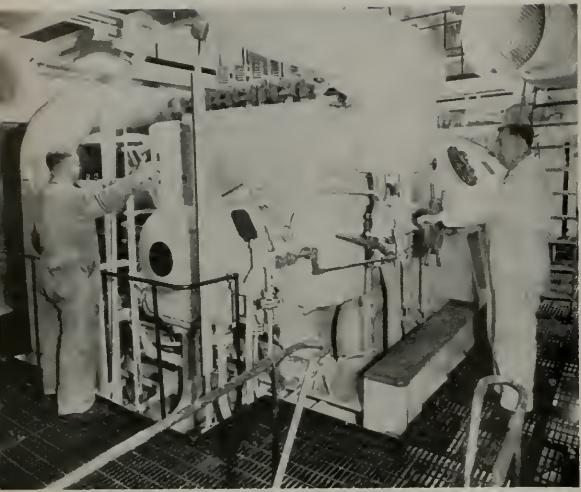
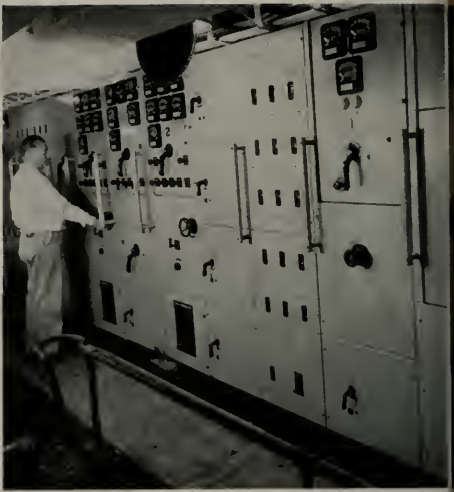


FIGURE 4



Turbine Generator Unit



Central Panel

shaft and thereby absorb the stored energy in the moving hull. These are:

1. By plugging the motor on its squirrel cage winding. This action takes place when the power leads to the motor are reversed and field current applied to the generator only. The motor during this period of plugging is attempting to run in the reverse direction while the ship momentum is still driving the propeller in the forward direction as a water turbine.
2. By dynamic braking action. In this case the power leads between the generator and motor are disconnected and field current applied to the field of the motor. This turns the motor into a waterwheel generator. The power produced can be quickly absorbed in an external resistor bank.

The limitation in the use of system one is rotor heating as the power absorbed is largely dissipated in the squirrel cage winding. System two is not limited to the same extent as the power absorbed is dissipated in an external resistor bank.

For a full understanding of the application problems involved, the fundamental characteristics of the various components will be described.

Characteristics of Squirrel Cage Induction Motors

To adequately design a motor for a specific purpose requires a full and complete knowledge of the characteristics and duty cycle of the driven apparatus.

The characteristics include such items as (1) the starting or breakaway torque requirements; (2) the time required to accelerate the driven apparatus from standstill to rated speed; and (3) the nature of the load during operation at rated speed. The latter includes any variation from the norm such as an intermittent high peak load which might tend to stall the motor.

The duty cycle relates to the continuity of service and whether the motor is to operate continuously or intermittently.

Squirrel cage motors are made in a variety of types to suit different services. These variations in type are accomplished by altering the resistance of the squirrel cage winding.

In both the industrial and marine auxiliary power field, squirrel cage induction motors have become more or less standardized into three types, as follows:

1. The low resistance rotor type which has small slip at rated load and speed, high pull-out torque value, and normal starting torque. Motors of this type have low rotor losses at rated speed and are therefore ideal for continuous operation. Motors of this type are used extensively for driving centrifugal pumps and fans and also for other applications where the starting torque requirements are not too severe.
2. The high resistance rotor type has high slip at rated load and speed, and its maximum breakdown or starting torque occurs at standstill. Because of the high rotor losses at running speed, motors of this type are used for intermittent service where the starting torque requirements are quite high. Typi-

(Please turn to page 96)

S.S. United States Victory of the India Steamship Company. Her main propulsion oil system is one of four cleaned by means of high solvency petroleum cleaner, in April, 1947.

CLEANING OF MARINE TURBINE OIL SYSTEMS

PETROLEUM SOLVENTS ARE BEING USED WITH SUCCESS in cleaning the lubricating oil systems of ship propulsion turbines. Flushing of oil lines, tanks and other component parts of new steam turbine oil systems before introducing the main oil charge has long been accepted practice. The purpose of such a procedure is to remove mill scale, core sand, rust preventives and similar foreign matter, thus lightening the burden on the main oil charge which is expected to perform its duties many years.

The need for cleaning the systems of turbines which were previously in service was definitely established when inhibited turbine oils were developed. It was found that all traces of oil oxidation products should be removed in order to obtain full value from the new charge. Actually, any turbine oils can be expected to perform satisfactorily throughout considerably longer service life if not contaminated when first placed in service by the remnants of old oil. Among the various factors which are harmful to turbine oils, oxidized used oil is among the foremost. Since a several thousand gallon fill of new oil represents a considerable investment, the fact that its service life can be appreciably shortened by the presence of oil deterioration products emphasizes the need for thorough removal of the latter. The mixing of new and old oils of any type decreases the effectiveness of the new oil, particularly if the old oil is much deteriorated. Cleaning is especially advisable if a system has been shut down and coated with preservative during layup.

Types of Cleaners

Petroleum cleaners are organic solvents. Their primary action is to dissolve coatings of oxidized oil, slimes and lacquers from interiors of pipes, oil coolers, tanks, and from around bearings. In addition to solvent duties, cleaners should be able to cause dissociation of sludges into oil and water phases, and to effect removal of both phases. To facilitate the latter, small percentage of other organic chemical solvents are added to the petroleum solvent base.

Two types of petroleum solvent cleaners have been used successfully, each adapted to particular conditions. For new turbine systems, where, as mentioned above, the purpose of cleaning is to remove sand, mill scale and such materials left from manufacture, a low viscosity cleaner having a light lubricating oil base is suitable. For turbine systems in which old oil has left deposits, successful cleaning is best effected special products having a high degree of solvency.

Although petroleum solvents can dislodge loose rust by mechanical washing action during circulation, they cannot be expected to remove tightly bound rust. Wire brushing or similar hand cleaning may be necessary if such rust exists.

Petroleum solvent cleaners have distinct advantages which make their use relatively simple and safe. Since they do not react with any materials normally found in turbine oil systems, precipitation of harmful deposits resulting from their use is impossible. Because they are completely miscible with turbine oil in any proportions, their complete removal by displacement with oil is easy and effective. (Finishing by wiping with lintless rags is also necessary.)

Cleaning Procedure

After it is determined that a particular system can best be cleaned by means of petroleum solvents, all the old oil should be drained and pumped out, preferably while warm. It is desirable that insofar as possible, all lines and tanks be completely emptied of old oil. After this is done, enough solvent is pumped into the sump tank so that it may be freely circulated by the main lubricating oil service pump. Fine mesh (100 per inch recommended) baskets are installed in the duplex magnetic strainer housings. Cloth bags likewise installed may also be used after the wire screen has removed larger impurities. Circulation of cleaner is then begun, during which the solvent is heated to about 150° F. Heating may be effectively done by connecting steam lines to the water side of at least one lubricating oil cooler. The length of time for circulation depends on the amount of deposits to be removed. In general, cleaning can be accomplished in 12 to 24 hours' circulation, but must be continued until the oil strainers do not collect any more foreign matter and all metal surfaces visible through inspection holes are definitely deposit free. It is well to circulate cleaner through all oil tanks, lines, and coolers, and to utilize both service and standby oil pumps enough so that the system of each may be thoroughly cleaned. Particularly in the early stages of cleaning, strainer baskets must be frequently changed and cleaned of accumulated dirt to avoid possible rupture of them through excessive pressure difference. It is often advisable to connect a hose and spray nozzle to a high pressure oil source in the system, and wash with a stream of solvent surfaces

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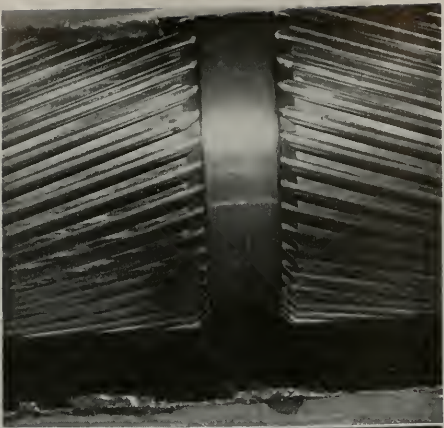

After five years operation following good initial cleaning job, microscopic examination failed to show an appreciable wear on this high speed pinion.

Reduction gears after three years of operation on the same batch of inhibited turbine oil. Shell Turbo Cleaner was used prior to inserting new oil change.

Oil's eye view of duplex strainer with rust, scale and chips removed in five minutes of circulation. Improper cleaning of new turbine resulted in pickup of this matter by the new oil.

EVERETT PACIFIC RECONVERTS SEA SCORPION

PREPARATORY TO ENTERING the transpacific cargo-passenger service, the *Sea Scorpion,* recently acquired by the Pacific Transport Lines from the U. S. Maritime Commission, is undergoing complete repair and reconversion at the yard of Everett Pacific Shipbuilding and Dry Dock Company, Everett, Washington.

Built in 1945 for the U. S. Maritime Commission by the Ingalls Shipbuilding Corp., the *Sea Scorpion* is a C-3 type cargo vessel of 12,000 tons deadweight, is 465 feet long, and has a speed of 17 knots.

One of the major items included in the specifications called for repair of extensive hull damage which covered practicaly the full starboard side of the vessel. Indentations in plates and frames varied in depth up to about eight inches. The damage was mostly in an area two strakes wide between frames 62 and 146, some of which was in way of reefer spaces and tank compartments. The areas or sections showing the greatest amount of damage were cropped or cut out, sent to the plate shop, faired and returned in their entirety including the respective frames involved. This entire area, involving approximately 1550 square feet and 30 tons of steel, was not removed plate by plate and frame by frame, but rather was taken out in four sections with frames attached. As may be seen in detail in the accompanying photographs, these sectional removals were made as follows:

1. G & H Strake, frames 59½ to 70½ inclusive, in way of #2 Hold. Tween deck connecting shell in way of G strake. Frames 67, 68 and 69 removed separately, faired and returned.
2. G & H Strake, frames 70½ to 86½ inclusive, in way of #2 and #3 Hold. Tween deck connecting shell in way of G strake. Reefer area in way of H strake, and upper edge of G. Frames 73, 74 and 75 removed separately, faired and returned.
3. G Strake, frames 105½ to 111½ inclusive, in way of machinery space. H Strake, frames 103½ to 111½ inclusive, in way of starboard settling tank and boiler room.
4. G Strake, frames 116½ to 127½ inclusive, in way of machinery space and #4 Hold. H Strake, frames 114½ to 129½ inclusive, in way of reefer ma-

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At top: The Sea Scorpion shortly after her arrival at the Everett Pacific yard for reconversion. Upon completion, she will be renamed the Pacific Transport and become the flagship of Pacific Transport Lines transpacific fleet.

Center: Starboard side of Sea Scorpion looking aft. Second and third sections cut out by yard are slightly aft of midship. Together they weighed 12 tons with an area of 665 sq. ft. After fairing in Plate Shop they will be set back in place for welding.

At bottom: Starboard side looking forward showing huge sections removed by yard for straightening. The forward section weighing 8 tons and covering a 364 sq. ft. area, has already been returned from shop and set in place preparatory to welding. Note the open area with frames missing. This 10 ton, 520 sq. ft. section was sent to shop for fairing with frames attached.

The Sovereign of the Seas in 1637. Inside there was wormy bread.

THE SHIP'S GALLEY

PART II — DEVELOPMENT

By A. J. Dickie

ABOUT 350 B. C. a famous Athenian painter named Antiphilus wrote a rather poetic description of his favorite outdoor sport which gives us a good idea of the methods used in preparing food on shipboard in those far off days. Says he "Mine be a mattress on the poop and the awnings over it sounding with the blows of the spray and the fire forcing its way out of the hearth stones and a pot upon them with empty turmoil of bubbles; and let me see the boy dressing the meat and my table be a ship's plank covered with a cloth; and a game of pitch and toss, and the boatswain's whistle."

Reading between these lines we see that the open air galley or marine kitchen of the ancients was a crude forerunner of the modern garden fireplaces fitted for outdoor cooking.

A raised hearth generally arched to admit passage of air between deck and stones and having a square or oblong enclosure of stone built to surround the fire with an opening on one side fitted with a grate and damper, and an opening on top for a large pot provided our forefathers both on land and afloat with the means of boiling or roasting anything that required cooking.

In front of the grate opening or fastened in the stones alongside of that opening would be the brackets to support a spit on which the broiling or roasting was done, usually with the help of a boy who turned the spit so that the meat or fowl would be evenly heated and not burned on one side. Electrically operated and heated broiling spits for poultry may be seen today in many cafe windows in San Francisco or any other large city. For baking bread there were various arrangements, such as chambers with doors built into the structure of these fireplaces, or Dutch ovens of iron, or raking out the fires and baking on the hot stones.

In early days of navigation when life was a leisurely business practically all sea travel was coastwise. The ships were usually laid up at night, and part of the crew, passengers or soldiers put ashore to forage.

Herodotus tells us that one of the Pharaohs of Egypt chartered several Phoenician galleys with their crews and officers and sent them on an exploring trip to circumnavigate Africa. Three years after they left the Mediterranean they arrived in the Red Sea, after coasting all the way and even having gone ashore and grown crops of corn to replenish their stores. There were always edible fish in the sea, and edible animals ashore.

The old Viking ships, which made long voyages, such as Norway or Denmark to Iceland or to Greenland, or to Palestine, had bronze cooking pots heated over open fires much the same as those of the ancient Greeks. In their coastwise voyages these hardy seamen usually pulled into some fiord or harbor at night and spread a great awning over the vessel for shelter. Often they built their cooking fires on the beach. Their staple provisions were salt meat, salt fish, and hard dry bread. The "Saga of the Ere-Dwellers" tells us "In those days was it the wont of the Chapmen to have no cooks, but the messmates chose by lot among themselves who should have the ward of the mess day by day. Then too was it the wont of the shipmen to have their drink in common, and a cask should stand by the mast with the drink therein, and a locked lid was over it. But some of the drink was in tuns, and was added to the cask thence, as soon as it was drunk out."

The commander on Viking ships had his own mess-table or meat-board.

An interesting paper on the development of Naval Architecture by Nathaniel Barnaby read in 1860 at the first meeting of the Institute of Naval Architects throws some light on the evolution of the galley and its importance on shipboard. The paper covers five hundred years from 1360 to 1860 and shows that in the 15th century "cabins for all ordinary purposes were introduced into British ships, particularly war ships." Such small enclosed spaces included "a buttery, a pantry, a spicery, an ewery, and a chandlery," surrounding the "galley and cooking apparatus," which were in the central portion of the hold of the ship. This left only the "extremities" of the ship for stowage. The great ship "Henry Grace de Dieu" was built in this fashion in 1515.

By 1560 according to Barnaby the naval architects learned the weakness of this plan which by forcing all the heavy stowage to the "extremities" of the ships, caused much hogging in their hulls and made them very cranky and hard to steer in rough weather. So they moved the galley up on deck leaving the entire hold space for stowage which was a very major improvement. During the 15th century, with the small stowage space, whenever an English ship was fully manned for fighting she had to have a tender or "victualler" go along with her to supply provisions for the crew. During the 16th century cooks were carried on British war vessels while France and other West European nations still had the messes of the crew do their own cooking.

Each ship carried a steward whose duty is was "to deliver out the victuals" to each mess. Each mess ate and slept and kept their personal property in a space between two guns on the main or gun deck. These spaces differed in area so the mess might be four, five, or six men.

The general rule of allowances for rations is interesting. It "allowed" to every man and boy: one pound of bread and a gallon of beer per day; on flesh days (Sunday, Monday, Tuesday, and Thursday) one pound of beef or one pound of pork with pease per day; on fish days (Wednesdays and Saturdays) a side of fish (haberdine, ling or cod) to each mess of four men and seven ounces of butter and 14 ounces of cheese, per day; on Fridays half the allowance of fish plus the butter and cheese.

The beef and fish were preserved in salt pickle in barrels and frequently putrid. The bread was dry, stale, and more often than not full of worms. The butter was rancid. The allowance was ample enough if it had been accompanied by fresh vegetables and fruits. However in those days, much of the provisioning of ships was contracted out to "victualling" firms, and the inspection was very lax. As we showed in the introduction to this series there was great mortality among the crews of seagoing vessels due to scurvy and other diseases induced by deficient diet.

This condition caused much mutiny in the British Navy during the 17th and early 18th centuries.

The galley however was still much the same as that which intrigued Antiphilus some 2000 years earlier, except that it had lost its picnicy flavor by being enclosed in the structure of the ship as shown by a definition of 1750 A.D. Blankey's "Navigators Expositor" printed in London during that year carries this gem. "Galley is a

(Please turn to page 95)

"a mattress . . . a plank . . dressing the meat . . ."

CORROSION AND OXIDATION IN STEAM SERVICE

By PAUL M. BRISTER and J. B. ROMER

(Continued from last month)

B. METALS USED IN BAFFLES, HANGERS AND SUPPORTS LOCATED IN HIGH TEMPERATURE GAS STREAMS

IN CERTAIN CASES METALLIC BAFFLES, hangers and supports are placed in the stream of high temperature flue gases and it is frequently impracticable to water-cool these baffles; hence they operate at temperatures of the order of 1000° to 2200° F (540° to 1200° C). These plates suffer through the conversion of their surface layers to oxides, suffides and sulfates. Irrespective of the actual nature of the end products, common language is to refer to them as burnt, wasted away or oxidized. Our present experience indicates that alloy materials containing 25 per cent Cr, 12 per cent Ni or 25 per cent Cr, 20 per cent Ni are practical for this type of service.

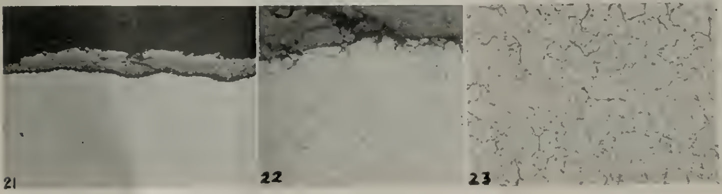
C. METALS USED IN SUPERHEATER TUBES

In a high pressure, high capacity steam generating unit the superheater receives dry saturated steam from the boiler at a temperature of 540° to 640° F. (282° to 338° C), depending on the operating pressure. The steam is superheated as it passes through the tubes up to an average final temperature of 925° to 975° F (496° to 524° C) with some new designs calling for 1000° to 1050° F (540° to 565° C). In order to obtain these high steam temperatures, the superheater must be located in a zone of high gas temperature. Depending on the final steam temperature desired and the ash characteristics of the fuel being burned in the furnace, the gas temperature entering the superheater will be in the order of 1900° to 2200° F (1040° to 1200° C). In order to keep the superheater tubes free of ash deposits which will decrease the heat transferred from the flue gas to the steam, deslaggers or soot blowers are used. These deslaggers are arranged to discharge a high velocity jet of steam against the superheater tubes in such a manner that any ash or slag thereon will be blown off.

The metal in a superheater tube normally will be from 50° to 150° F (28° to 83° C) hotter than the steam temperature in the tube because of the temperature drop across the steam film immediately adjacent to the inside tube surface. The actual amount of the drop depends on the steam velocity and the heat transfer rate. This would mean that in a superheater delivering steam at an average temperature of 950° F (510° C) where the maximum steam temperature in the hottest tube would be about 980° F (528°C), the metal temperature of the hottest tube might be 1130° F (600° C) on the steam side, and 1170° F (630° C) on the gas side. This is in the range where it is known that the iron-steam reaction will occur. It is also in a range where air oxidation can be severe, and where the strength of ferritic type steels and alloys is very low.

Evaluation of Available Tube Materials

This program included extensive investigations on the creep characteristics by F. H. Norton at Massachusetts Institute of Technology and extensive steam corrosion investigations at Purdue University by Potter, Solberg and Hawkins. Their data have been published at various times in the Transactions of the American Society of Mechanical Engineers. This work of Potter, Solberg and Hawkins has been invaluable in establishing maximum



Figs. 21, 22, 23: Oxide scale on steam side of 5% Cr ½% Moly superheater tube after 10,000 hrs. Unetched. 100 Diam. Fig. 22. After 10,000 hrs. Picral etch. 500 diam. Center of wall, same tube as Figs. 21-22, after 10,000 hrs. Picral etch. 500 diam.

Before the Electrochemical Society at Louisville, Ky., Paul M. Brister, staff engineer, and J. B. Romer, chief chemist, of Babcock & Wilcox Company, presented a paper on the causes of corrosion in steam generating tubes and superheater tubes in high pressure boilers. In July, Pacific Marine Review, excerpts and illustrations from the first part of this paper were published. Herewith are excepts from the concluding parts.

temperature limits for steel and the various alloys used in superheaters.

A discussion of high temperature corrosion of superheater tubes must necessarily consider the stresses involved since both are closely associated when a failure occurs. Because of the creep characteristics of steel at high temperatures, the stress must be low enough so the metal will not creep excessively throughout the life of the boiler. The American Society of Mechanical Engineers established maximum stress values for design purposes that where approximately equal to 80 per cent of the stress to give a creep rate of one per cent in 100,000 hours, and these were the maximum stresses used in designing the high temperature superheaters on which we have had our experience.

The 1944 revision of the ASME Boiler Construction Code permitted a 25 per cent increase in this stress, but very few boilers built in accordance with the revised code have been placed in service.

Steam Corrosion

We have experienced some failures that can be attributed, in part to steam corrosion.

In three cases, which are the three most severe cases

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Fig. 24. At gas surface of same tube as Figs. 21-23 after 10,000 hrs. Picral etch. 500 diam. Figs. 25, 26, 27: A 5% Cr ½% Moly tube that failed operating above design level. ¾ diam; Same tube as Fig. 25, structure at fracture, unetched, 500 diam.; Same tube as Figs. 25-26, close to fracture, Picral etch, 500 diam.


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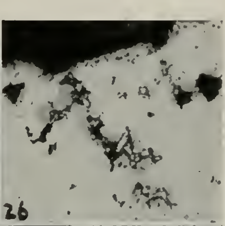
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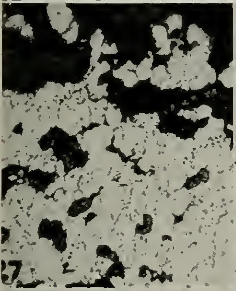
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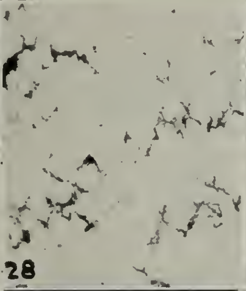
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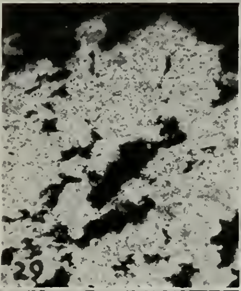
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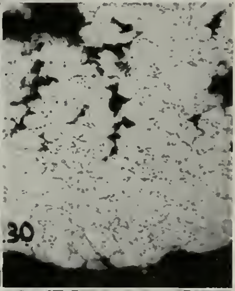
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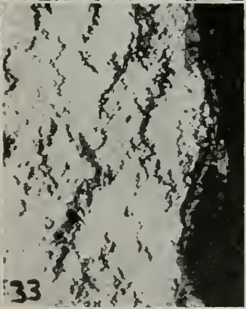
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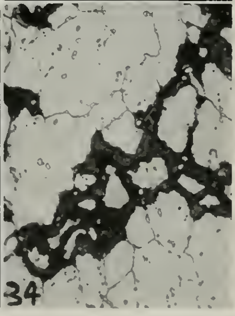
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Fig. 28. Same tube as Figs. 25-27, close to fracture, Unetched, 500 diam. Fig. 29. Same tube as Figs. 25-28, at outer wall. Picral etch, 500 diam. Fig. 30. Same tube as Figs. 25-29, at inner wall, Picral etch, 500 diam.

Figs. 31 to 34 show photomicrographs of another tube that failed in similar manner. Figs. 31-32, at 1000 diam. and 100 diam., show the outside and inside surface near fracture. Fig. 33, same tube as other two, edge of fracture, Etched, 100 diam.; Fig. 34, same tube as Figs. 31-33, ¼ inch from fracture at outer walls, etched, 1000 diam.

--With The

San Francisco Society of Port Engineers head table at July meeting. Left to right: Joe Riemers; Ray Sample; Louis Deppman; Guest Speaker J. A. Ryan; and W. K. Volkers.

The July meeting of the San Francisco Society of Port Engineers was held in the Whitcomb Hotel on the evening of July 2 and presided over by Vice President Louis Deppman.

After dinner, the members were addressed on the technical phases of fuel oil production and usage by J. A. Ryan, California Research Corporation. During the question period Mr. Ryan and W. K. Volkers of Standard of California furnished the answers to many problems presented from the floor. A rewrite of Mr. Ryan's talk prepared especially for Pacific Marine Review by Mr. Ryan is published herewith.

Following the technical discussion the Standard Oil folks showed some spectacular moving pictures of fishing and hunting in the West.

PETROLEUM FUELS

By J. A. RYAN
California Research Corporation

BY FAR THE GREATEST PART OF CRUDE PETROLEUM is consumed as fuel for the production of heat or power. Fuels range from the liquefied petroleum gases, through gasoline, kerosene, heating oils, diesel fuels and residual fuels.

In the manufacturing process, crude oil is charged to a distillation unit and is split into "cuts", among which are gas oils, from which burner and diesel fuels are prepared, leaving an undistilled residuum.

Diesel and Burner Fuels

From the gas oils, after refinement, if necessary for removal of impurities, diesel and burner fuels are prepared. Care in handling insures not more than traces of sediment and water (S & W) and ash. Volatility is controlled in the distillation process and this in turn controls the viscosity which is an important property, particularly of diesel fuel. If the viscosity is too low the fuel will not properly lubricate the moving parts of the fuel system and may cause injector leakage with attendant smoking; if the viscosity is too high, atomization is adversely affected.

Cetane number is one of the most important properties of a diesel fuel, as it is a measure of the evenness of combustion of the fuel when used in diesel engines. A high cetane number is usually associated with smoother engine operation and freedom from knocking, but also signifies easier starting in cold weather and reduced smoking tendency. Cetane number is controlled by the refiner through selection of stocks or degree of refinement or both.

Crude oils contain varying proportions of sulfur distributed through cuts of all volatilities. Some of the sulfur compounds are corrosive in the unburned state and must be removed by refining. All sulfur compounds, on burning, produce materials which are corrosive under certain conditions. There is wide disagreement among engine manufacturers as to permissible sulfur limits.

More than a trace of ash in a distillate fuel is most apt to be the result of contamination as every effort is

Port Engineers - -

made to insure a clean product at the refinery. No properly refined and uncontaminated distillate diesel fuel will contain harmful amounts of ash.

Low speed diesel engines are much less critical of fuels than the smaller high speed engines, and satisfactory results may be obtained with a light residual fuel. There is a distinct economic advantage in the use of residual fuels where possible since they are not only less expensive but have a higher energy value on a columetric basis.

Boiler Fuels

Bunker fuels cover a wide range of gravities and viscosities, the two most commonly designated properties. Methods of manufacture are also quite diverse but the products may be placed roughly in two general classes, straight run fuels and cracked fuels.

The residuum from primary distillation may be marketed directly or blended with other straight run stocks to controlled specification limits. This is seldom done in the United States because the heavy demand for gasoline makes it more profitable to crack a residuum or a heavy gas oil and thus increase the yield of gasoline from each barrel of crude. The cracking process produces an entirely new residuum which is lower in gravity and higher in viscosity than the original charging stock. It also pro-

(Please turn to next page)

PORT ENGINEER OF THE MONTH

Los Angeles - Long Beach Harbor

JOE WOSSER OF MATSON LINES

Joe Wosser is a native of California. He was born in Marin County and at a tender age in 1912 he went to sea. His first job was with the Oceanic Steamship Company as oiler and water tender. In 1915-1916 he obtained his Third Assistant license and shipped on Pacific Mail's *Korea* as second assistant. Joe was still aboard after the *Korea* was sold to the Atlantic Transportation Company.

In 1916 Mr. Wosser went with Pacific Mail and sailed on the *Equador* as third, second, and finally first assistant until 1919. In 1920 Joe got his first assignment as Chief with the Williams Dimond Co. and American-Hawaiian, then operated by the Shipping Board.

In 1924 he went with the Panama Mail Line on the San Francisco to New York run aboard the *Columbia.* In 1926 he joined Los Angeles Steamship Company and sailed as second and later as first on the *City of Los Angeles.* In 1927 he signed on as Chief on the *Calawaii* and later on the *City of Honolulu.*

It was in 1931 that Matson acquired the Los Angeles Steamship Company and Joe Wosser has been with Matson since that time, serving on various of the Matson fleet as Chief.

In 1943 Joe came ashore as Construction and Repair Supervisor in San Francisco and in 1944 transferred to Seattle as Repair Supervisor covering the Northwest area. In 1945 he took over his present job as engineering supervisor of Matson at Los Angeles.

Joe has sailed with some of the best. Captains such as A. W. Nelson, Tommy Blau, Henry W. Nelson and engineers such as Milton Towne, Bob Paul, and John Keenan.

When asked about his hobbies he said, "Just haven't had time but the wife does keep me on the lawnmower."

Joe Wosser, Matson Port Engineer.

PORT ENGINEER OF THE MONTH

SAN FRANCISCO

LOUIS A. DEPPMAN,
Port Engineer,
Sudden and Christenson

Louis A. Deppman, port engineer for Sudden & Christenson, Inc. and vice president of the Society of Port Engineers was born in Chicago on November 14, 1900, but received his schooling in Seattle. In July 1915 he went to work for Puget Sound Navigation Company as oiler on the *Kulshan, Sol Duc and Iroquois.* That fall he returned to school and the following summer sailed as oiler on the *SS Firwood,* with Billy Gates as Chief. During this summer of 1916 he took a beating for he was always seasick. When World War I came along he sailed as oiler and water tender on various ships of the U. S. Shipping Board, making two voyages as a waived third engineer. Late in 1919 to 1921 he worked in shops of Hefferman Engine Works, Seattle. In 1922 he took a run to Australia with the Oceanic Mail Line.

During the year of 1923-1924 he signed on as deck engineer on the *President Jackson* out of Seattle for the American Oriental Mail Line, and in 1925 he was third assistant engineer on the *President McKinley.* The following years: 1926 Alaska Steamship Co., he was second assistant on the old *Redondo* and spent the winter in company shop gang. From 1927 to 1930 he rejoined *President McKinley* as second assistant engineer; March, 1930 he transferred from *President McKinley* to *President Cleveland* as second assistant engineer, and in April 1934 he became first assistant engineer and later chief engineer of the *President Cleveland.*

In December 1938 Deppman took a six months leave of absence to try to get located ashore. In February 1939, he took the examination and became a Certified Boiler and Machinery Inspector of California, going to work for Swett & Crawford, Inc., until the war broke out when he moved over to the Office of Coordination for Ship Repair & Conversion until September 1943, when he was released to assume duties of Port Engineer for Sudden & Christenson, Inc., who at present are operating 10 vessels.

Mr. Deppman holds a U. S. Naval Reserve commission as Lieutenant.

Two of the Puget Sound Navigation Company's vessels on which Louis Deppman labored. At top: The Sol Duc, built in Seattle in 1912 as part of the steel shipbuilding program entered into by the Puget Sound Navigation Company in 1910—and six steel ships were built in the period between 1910 and 1913.

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At bottom: The Iroquois, a familiar ship and a familiar name, went into the Victoria service in 1928, following conversion to a 215-foot ferry at Lake Washington Shipyards in 1927. Originally brought out from the Great Lakes in 1907 for the Seattle-Bellingham-Vancouver run, she saw service in World War I, training men for "Pershing's Bridge of Ships." Now, after 19 years of faithful service, the Iroquois gives way to the streamlined Chinook, new queen of Puget Sound waters. See feature on page 38.

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duces a gas oil cut, which has some quality limitations, but which is entirely satisfactory as a "cutter" in residual fuels. Heavy residuum must be reduced to the required viscosity by cutting with a light stock.

In recent years a new type of cracking process has been developed by the refining industry; catalytic cracking. The raw materials for this process are the same gas oils that provide burner and diesel fuels and here again the portion that is not converted to gasoline is different from the charging stock but is still a gas oil. It has limited

Seen at the July 2 meeting of the Society of Port Engineers in San Francisco.

usefulness as diesel fuel because of its low cetane number, but is an excellent cutter stock for use in residual fuels. Catalytic cracking has reduced the volume of gas oils available for use in marketable distillate fuels and narrowed the price differential between these products and gasoline.

There are two sets of specifications covering manufacture of residual fuels under which the Pacific Coast oil industry operates; the Pacific specifications and the Commercial Standards (CS-12-40) of the Department of Commerce. P.S. 300 and C.S. #5 fuels are low viscosity residuals, primarily intended for commercial heating without the necessity of preheating. P.S. 400 and C.S. #6 fuels are broad enough to cover all other residuals up to 300 Furol viscosity at 122°F. The specification, "Bunker C", has long been obsolete but covers approximately the same range as P.S. 400 or C.S. # 6.

Viscosity is the one physical property that concerns all fuel oil users as it directly determines pumpability and ease of atomization. Fuels must be pumped at storage temperatures and the length and size of suction lines determines the limiting viscosity where tank heating facilities are limited. Viscosity also plays an important part in atomization; that is, viscosity of the fuel determines the temperature at which effective atomization can be obtained at a given pressure. Atomization with pressure burners is likely to be poor if the viscosity is higher than 150 Saybolt Seconds Universal (SSU) and improves as the viscosity is reduced. With the facilities generally provided on shipboard, adequate temperatures are readily attainable with most bunker fuels.

A number of years ago, when thermal cracking was undergoing rapid expansion, fuel oil consumers began to experience trouble with sedimentation in storage tanks and fouling of oil heaters. Intensive research within the petroleum industry determined the cause and corrective methods were devised. Slight modifications in the cracking process and care in selection of stock used in fuel blends have eliminated this trouble but there remains the problem of incompatibility. For example, two fuels which individually are stable, may cause trouble when mixed. This is of particular concern to ships that may have to take fuel in different parts of the world.

A war time development in burning of fuel oil is slag deposition on superheater tubes.* Tentative conclusions are that the causes are largely operational. If the fuel is completely burned before the furnace gases enter the tube bank, the ash particles are so small that their momentum is essentially zero and they will not penetrate the stagnant gas films on the tubes. However, if atomization is coarse, unburned fuel particles containing ash will penetrate the films and adhere to the tube. The combustible material in these particles is consumed leaving the ash to build up as slag. Temperature changes with load cause the slag to crack and move. With comparatively wide tube spacing conditions may not become serious, but with narrow passages, complete stoppage over large areas may occur. This suggests that to avoid plugging, the burners should be kept in good condition. Operating temperatures and pressures should be carefully controlled and every effort made to keep the tubes clean by whatever means are available.

VOYAGE COSTS

Expenses of operating the *SS Matsonia* between San Francisco-Los Angeles and Honolulu have gone up 106 per cent over preware, a Matson Lines surveys show.

Operating and handling costs of a single typical voyage are now running at $157,000, as against $75,992 in 1940.

Greatest single increases are in wages and overtime of crew members, according to Hugh Gallagher, Matson vice president, who pointed out that this item is up 189 per cent over 1940. The increase includes a 5 per cent increase negotiated in the recent extension of labor agreements—latest in a steady procession of wage boosts.

Other principal items include handling charges, up 154 per cent; food, up 110 per cent; fuel oil, up 122 per cent; stores and equipment, up 28 per cent; port charges, up 43 per cent, and insurance up 42 per cent.

In contrast to the average 106 per cent increase in costs, passenger fares on the *SS Matsonia* have gone up only 24 per cent since 1940, Gallagher said.

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* McClosky, L.C. Com. U.S.N.R "A Study of the Causes of Hard Slag deposits on Fire Sides of Naval Boilers," Jr Amer Soc. of Naval Engineers, May, 1947, Pp. 146-164.

Pacific WORLD TRADE

Reg. U S. Pat. Off

By T. Douglas MacMullen

AN APPROACH TO IMPROVED PHILIPPINE-AMERICAN RELATIONS

By MERLE ROBIE, Philippine Resident Representative,
COLUMBIAN ROPE COMPANY

Mr. Robie was guest of honor at a luncheon given by K. R. Atwater, Pacific Coast Manager of Columbian Rope Company, at the Palace Hotel in San Francisco July 21.

Guests in attendance included representatives of San Francisco steamship companies and marine, export and import trade publications, San Francisco bankers engaged in foreign trade, correspondents from Philippine newspapers, guests from the Philippine Consul General's office, and prominent San Francisco business men.

THERE IS GREAT NEED for a realistic approach to the Philippine situation by all Americans, particularly businessmen. I say this on the basis of seven years of continuous study of the Philippines, three years of which were spent in a Japanese prison camp. I was thus furnished an opportunity to study the Filipinos under the most adverse conditions and under all manner of circumstances; before the war, during the war, and during the present postwar reconversion period. I have come to know them intimately, not only as a people in the throes of reorganizing their country as an independent republic, but as individuals at work and at play, in their homes and in my home, and as head of an organization of four hundred Filipino employees.

There are four most vital questions that affect Americans in the Philippines, and particularly American businessmen. These must be faced if we as a nation are to work out better relationships with the people of these Islands. The Philippines remain a most important source of supply to our country of such strategic, bottleneck materials as chromite, manganese, sugar, copra and the most important source of the raw material with which I am most familiar, Manila hemp.

First, I think we must recognize, as Americans with a vital stake in furthering business between the Philippines and the United States, the need for fair and equitable dealings with the Filipino people. If we adjust our business practices to this long-range view we shall find that our trade with the Islands will increase and will be on a firmer foundation.

The second question is this: the need for American business in the Orient to devote more thought to the internal economic and social problems the people of the Philippines face. They are not unique, they confront the people of every country in the world today in this chaotic postwar period. Everywhere there exists the basic struggle of private enterprise versus socialization. We must do our part to give the small businessman a chance so that there will continue to be such a thing as private enterprise.

The third question concerns the specific economic problems which face the Filipinos; their inflation, the shortage of shipping, their particular difficulties of reconstruction, their relationships with other governments. We, as American businessmen, must familiarize ourselves with these problems if we are to be their good and true friends, and if we are to build our business with

A TIE THAT BINDS

Speaker at Columbian Rope luncheon in San Francisco was Merle Robie (third from left), Philippine Resident Representative for the company. Others, left right: W. Dearborn Clark, vice president, American-Hawaiian; Dale Blanton of Atkins Kroll Company, and William L. Montgomery, managing director, Far East American Council for Trade & Industry. Seems like Bill is telling a good one.

them upon a basis of mutual understanding and cooperation.

And last, I will touch very lightly on the situation in regards to production, investment, and prices which we, in this country, and the people of the Philippines face in the development of that strategic fibre, Manila hemp, the vital importance of which was emphasized by the war.

Many American businessmen in the Philippines today have not fully grasped the significance of the fact that we are now guests of the Filipinos in their own country. American capital is needed in the Islands, and the Philippine people welcome American investment, but in the long run, the American businessman can succeed in the Islands only by pursuing a policy of full cooperation with the Filipino people. We must remember this not only in our business dealings with the Filipino people but also in our social dealings.

It is because our country's attitude toward the Filipinos has followed this line of thought that our government's record in the Philippine Islands is an unparalleled one where dealing with so-called colonial peoples is concerned. It is for that reason the Philippine people look to us today for help in the development of their country and its resources, resources which have as yet hardly been tapped. But just because we have aided the Filipinos so much in bringing them to their high level of democracy as compared to their neighboring countries in the Far East, it is imperative that we Americans do not feel that our job is finished. Rather we must continue the work that has been started, continue in every possible way to cooperate with them in restoring prosperity to the Islands.

All of us know how much smaller the world is today compared to the days of empire celebrated by Kipling. I don't think Kipling would have been as dogmatic about the impossibility of East meeting West had he been able to fly from Manila to San Francisco in 42 hours as I did last February. Regardless of our feelings in the matter, we cannot fail to recognize that conditions in the Far East have drastically changed during the past decade. We cannot deny that the prestige of the Occidental is no longer measured in terms of the number of his servants and the magnificence of his living. The businessmen of today who occupy a secure place in the hearts of the Philippine people are the ones who are willing to work with them, to accept them, to cooperate with them. It has been my observation that since V-J Day, as never before, the most successful American firms in the Philippine Islands are those which are giving the Filipinos as large a share of responsibility as they can assume and encouraging them to accept it. Speaking for our own organization in the Islands, I can truthfully state that by advancing Filipinos to positions of great responsibility we have received extremely satisfactory work and a loyalty that is of the highest calibre. This is a concrete example of my point, and I am sure that this method will work equally well for any firm in the Philippine Islands that is willing to give it an honest trial.

The second question concerns a way of doing business. If we are to compete successfully with other economic methods, we must conduct ourselves and our business dealings so that other peoples can see that our way offers more for them—and not just for us. Accordingly, to those American businessmen in the Philippine Islands who are engaged in the procurement and export of essential raw materials and who reap more than their fair share of profit, I have the following to say. There is a place for the middle man in the Philippines as in any other country—if he performs a necessary function. However, it is my belief that he has abused his position if, acting as a buyer, he works to the financial detriment of the producer, or if a seller, he does not deal fairly with the consumer. We have found that it is possible to be both a buyer and a seller and to arrive at a solution for this difficult position. Our policy has been always to purchase from any seller who comes to our office, regardless of the quantity he has to offer, whether exceedingly large or very small, and to pay a uniform price to each producer which gives him a fair return. As a seller we do the same. We have no favored customers to whom we sell at cut prices at the expense of others. By such policies, our firm and others which deal fairly with the Philippine people are building good will for the American business system.

Today, the Filipinos, like many other peoples, are eagerly searching for a solution to their economic problems. They are considering the feasibility of solving those problems through nationalization. The idea of nationalization is not foreign to the Philippine Islands or to any other country any more. It is a concept that exists everywhere today. Therefore, it behooves us, as American businessmen, to do our utmost at all times to make the system we believe in work for the benefit of all, not merely a few.

My third point, concerning specific internal problems of the Philippines, can best be understood by comparing their situation with ours. Here we are, wrestling with economic problems that have been with us for decades, and we are still, I think you will agree, in a blue funk about most of them—high tariffs versus sensible trade relationships, the arguments about planning in our economy, the price-wage structure, currency manipulations, and so on. Consider if we were back to the days when our republic first began and you will have put yourself somewhat in the position the Filipinos are in today. Naturally they welcome all truly disinterested aid that will enable them to take advantage of their own skills in meeting crisis situations in which many of our oldest nations are being crushed. It seems to me that any American business, or any American businessman worth his salt, must hold himself available and not be unduly critical of mistakes made by this new nation in its first years. More than that, he has an obligation to help the Filipinos work out their economic problems. As I have said, some of them are unique to the Islands in certain respects.

In my fourth point, I shall give you an example from my own field which illustrates this. This question concerns the matter of price as it affects production and investment. Let us consider the situation in Manila hemp, one of the most important raw materials produced in the Philippines, and the one with which I am most familiar. Manila hemp is used more extensively in the manufacture of cordage than any other fiber. I need not unduly stress the importance of rope in shipping, in agriculture, and in industry. What is the present situation in regard to Manila hemp, and what are the prospects for the future?

The world market for Manila fiber is considerably brighter today than we had anticipated a year ago. However, it can definitely be stated that the future is uncertain. To date, many factors have played an important role in the pricing of this fiber and in the quantities available, other than simply supply and demand. Even though production of Manila in the Philippine Islands has only been restored to two-thirds of the prewar level, that supply is very close to meeting demand since the mills of Germany and Japan are at present receiving nothing. However, in the years ahead, it is certain that they will take on fiber in increasing quantities. Also, in speaking of the hard fiber market, we generally think of the total supply, made up of Manila and sisal fibers. But when you consider that very little headway has been made as yet in restoring production in one of the main sisal fiber areas, the Dutch East Indies, you can easily see that the world supply of hard fibers is far below normal.

The natural reaction to this situation would be that what is most urgently needed is additional planting of fiber in the Philippine Islands. However, a study of the price structure of Manila hemp over a period of years does not present an attractive financial picture. In the first place, there is the initial outlay necessary to handle the great amount of development work needed, at a time when the country's economy is highly inflated. Secondly, there is a long waiting period before receiving a return on that initial investment. Now it is easy to say that one cannot lose on such a venture in view of today's price of Manila fiber, which is higher than the finished product was before the war. But when one considers that in the past Manila fiber has been known to take drops of six and seven cents a pound or more within a few weeks, you understand the financial risks taken by capital when investing in a Manila plantation. Even so, you might think that with the present high price the Philippine producer must be reaping a handsome profit. I must tell you that although he should be, he is not. The average cost of *the goods that determine the Philippine standard of living is four times that of* 1941. Thus the postwar problem of the Philippine producer is not only the price of fiber, but the price of commodities which he must have to maintain a decent standard of living.

He is powerless to control those prices, and until the export price level in the United States is reduced, it is obvious that the price of raw hemp is not going to come down. Nor will production increase. Therefore the whole problem of capital investment is tied up with the world economic situation. No part of the economic situation is unaffected by the whole. And the United States is largely the controlling economic force, particularly in the Pacific area.

What is true of the situation in Manila hemp is generally true of the other principal raw materials of the Islands. As one of our best customers, and a customer the Pacific Coast needs in particular, a stabilization of our economy would go far toward stabilizing the Philippine economy, and would be of especial benefit to our export trade.

PRESENT DAY PROBLEMS IN STEAMSHIP BUSINESS

By JOHN R. WAGNER, vice president

Pacific Far East Lines Inc.

WHILE THIS DISCUSSION RELATES TO THE FAR EAST and Pacific Islands, there is considerable shipping from the United States to many other destinations.

There are well over one billion people who are potential customers for the eventual future, compared with our domestic economy based on 150 million.

While there are many difficultiees to be overcome throughout the Far Eastern countries, including the important item of financial exchange, many of the present unsettled conditions must clear in the not too distant future. When this time comes, business should be very good.

Conditions in general at oriental ports, while not perfect, are far better now than was the case a few months back. Japan is probably the best working area for ships in the entire Orient. There is no delay whatsoever in discharging or loading and, in most cases, the work is performed in record time. In Korea, likewise, the Military and the Maritime Commission have done a fine job and there is no undue delay. In Shanghai conditions are exceptionally good. While there has been some unrest of late among stevedores there, the main difficulty is excessive costs due to the low rate of exchange and existing black market conditions, and this situation in Shanghai obtains regardless of the nature of one's business. Conditions at Hong Kong are good.

In Manila there is a great improvement over the situation of a year ago, but there still is dire need for warehouses and many other improvements. The Philippines have not received all the consideration they expected from this country for reconstuction. It is indicared they will now receive the last 45 million dollars of a 75 million which should still further improve matters. The Philippines, generally, seem very slow in reaching their prewar peak of activities. They have certain commodities, but are still endeavoring to secure many additional items required. In Guam there has been a unhappy situation in that everything is under the Navy or Army and naturally all the Government work, regardless of its nature, is given priority over commercial business. The

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Excerpts from a talk by Mr. Wagner before the July meeting of the Junior World Trade Association.

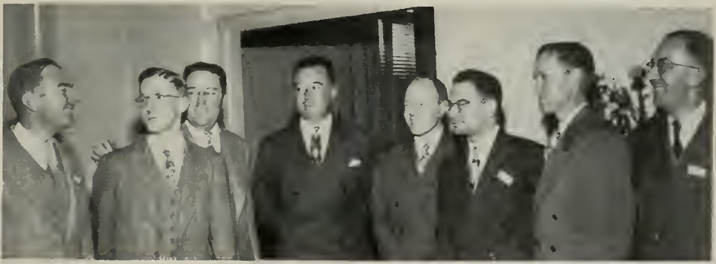
JUNIOR WORLD TRADE ASSOCIATION ELECTION

August first starts another new year for the Junior World Trade Association in San Francisco. The Association membership recently has chosen the following directors for the ensuing year:

Allan H. Eber, Reno J. Franchesi, Charles M. Freeman, John J. Mulvehill, Jr., Harold W. Nordberg, Herbert G. Porter, George Schmitz, Thomas B. Shaw, John L. Stewart.

The new board met and the following officers were elected unanimously:

President, Herbert G. Porter; Vice President, George Schmitz; Secretary, J. J. Mulvehill, Jr.; Treasurer, Thomas R. Shaw.



Left to right: J. L. Stewart, president of Junior World Trade Association; Florian T. Frank, John J. Buckley, Treasurer of Association; John R. Wagner, vice president of Pacific Far East Line; John J. Mulvehill, Jr., Secretary of Association; Allan H. Eber, vice president of Association; Lyford M. Morris, and Kenneth E. Macfarlane. Picture taken at July 2 meeting, held in the Marines Memorial Building.

Naval Governor of Guam promises that the situation there will be much advanced within the next two or three months. Meanwhile, some ships have lain there for approximately a month doing a very slow discharging operation, along with a marvelous job of pilferage and general mishandling of cargoes. Indonesian ports are slowed down at present while difficulties between the Indonesians and the Dutch are being settled, at which time there will be released some of their rubber, fibres, quinine, palm kernels and tobacco.

At the present time in Shanghai the Economic Commission of the United Nations is meeting, discussing the reconstruction and rehabilitation of all the Orient. Successful negotiations of this Commission would materially change this entire picture.

Important to Pacific Coast operators on shipments to the Orient is the competition now being furnished by East Coast and Gulf operators. Services from the Atlantic were always such that they presented stiff competition, but the number of vessels and the quick time in transit which they are now offering, makes the problem more serious. The leading lines in the Gulf are giving us much more severe competition than before the War. They have more vessels and their services are exceptionally good. Time in transit is getting less and less, and from a Chamber of Commerce standpoint I know they are all pulling for the Gulf. Rail rates from points near the Atlantic naturally favor the Atlantic operators.

Japanese Tonnage

It is hard to say at the moment just who will supplant the Japanese on the routes they sailed before the War. It is certain that all nations are striving seriously to handle some of this business once it materializes. From recent press releases you have probably noticed that business visitors will soon be allowed to travel to and from Japan. There is also the item of allowing for exchange of samples. All of this means that it will not be long until some semblance of commercial shipping between Japan and other countries begins.

Britain to date does not seem to have too much tonnage. In fact they are not anywhere near their prewar tonnage and with the many difficulties they are now having at home, it is to be assumed that some time will be required before they will again be the serious threat that they once were.

Some of the Scandinavian nations are now well out in front with tonnage and with the additional shipbuilding going on in these countries, it is felt they will well be able to hold their own in the future.

Of recent interest was the China Merchants Steam Navigation Company announcing that in addition to several new services throughout the Orient, it is going to establish services to California ports. It is believed for the moment this service will utilize three or four Liberties they now have and later possibly by some seven or eight Victories, presently under negotiation. Announcements as to California agents, schedules, and the like, are still to come. This will be the first time the Chinese have consistently sent vessels to this Coast and of further importance is the fact that the China Merchants Steam Navigation Company is a Chinese Government-owned company.

To offset some of the last few remarks, it should be noted that on June 25 there was an official release regarding American tonnage, which indicated that at present there are 138 companies operating 2539 ships. Of these companies, 91 were operating dry cargo vessels and 47 operating tankers. The dry cargo operators had 488 privately owned vessels, 1376 chartered vessels, and 118 general agency vessels. Tanker operators had 290 privately owned tankers and 267 on general agency.

Imports

The shipping business cannot be successful without homeward cargo, and the lack of imports is one of the primary reasons why outbound rates are so high. Most of the vessels come home in ballast or practically so, and if outbound rates were normal the operator could not make a living. For example, April figures from Hong Kong show cargo loaded to eight vessels for a total of 17,500 tons. During this time one vessel received 27 tons and the maximum on any steamer was 560 tons. From Hong Kong wood oil for the moment has almost ceased moving. This item previously made up approximately two-thirds of their tonnage. Consequently, an extremely poor showing at this time.

One of the few commodities that has been moving quite well for the last year is copra from the Philippines which is likewise now considerably down. April figures show the movement to the Pacific Coast as approximately 20,000 tons. The shipments moved on 11 vessels, some of which received 250 tons, one as high the 4500 tons. The Philippine Islands have a considerable mining industry. The mines generally are far behind schedule. In fact, Benguet and Balatoc are the only two gold mines that have resumed operating to date.

Someday we will see uniform practices in documentation, customs' requirements, bills of lading clauses, etc., in the steamship business. There have been some few steps taken in this direction. However, a lot more ground work is necessary and could be done well by World Trade organizations. This is an important item and should be kept before the public. If successful, uniform practices in documentation, would at some future date compare well with the International Postal Regulations,

(Please turn to page 97)

Pacific
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China Merchants Navigation Company Plan Extension of Line to America

In anticipation of the growing trade connections between China, Japan and the United States, extensive preparations are being made by the China Merchant Steam Navigation Company to inaugurate two international lines, the China-America line and the China-Japan line.

In the United States, the ports of call tentatively selected by the company include San Francisco and New York.

In Japan, a branch office of the company will be established shortly.

FOREIGN AIR MAIL POSTAL RATES

PUBLISHED BY THE WORLD TRADE DEPARTMENT of the SAN FRANCISCO CHAMBER OF COMMERCE

Country	*Rates of Postage per ½ oz.*	*Weight Limit*
Aden	25c	4 lbs. 6 oz
Afghanistan	25c	4 lbs. 6 oz.
Alaska	oz. 5c	70 lbs.
Albania	15c	4 lbs. 6 oz.
Algeria	15c	4 lbs. 6 oz.
Anglo-Egyptian Sudan	25c	4 lbs. 6 oz.
Angola	25c	4 lbs. 6 oz.
Argentina	10c	4 lbs. 6 oz.
Australia	25c	4 lbs. 6 oz.
Austria	15c	1 lb.
Azores	15c	4 lbs. 6 oz.
Balearic Islands	15c	4 lbs. 6 oz.
Belgian Congo	25c	4 lbs. 6 oz.
Belgium	15c	4 lbs. 6 oz.
Bolivia	10c	4 lbs. 6 oz.
Brazil	10c	4 lbs. 6 oz.
British Cameroons	25c	4 lbs. 6 oz.
British Guiana	10c	4 lbs. 6 oz.
British Somaliland	25c	4 lbs. 6 oz.
Brunei	25c	4 lbs. 6 oz.
Bulgaria	15c	4 lbs. 6 oz.
Burma	25c	4 lbs. 6 oz.
Canada	oz. 5c	60 lbs.
Canal Zone	oz. 5c	70 lbs.
Canary Islands	25c	4 lbs. 6 oz.
Cape Verde Islands	25c	4 lbs. 6 oz.
Central America	10c	4 lbs. 6 oz.
Ceylon	25c	4 lbs. 6 oz.
Chile	10c	4 lbs. 6 oz.
China	25	2 oz.
Colombia	10c	4 lbs. 6 oz.
Corsica	15c	4 lbs. 6 oz.
Cyprus	25c	4 lbs. 6 oz.
Czecho-Slovakia	15c	4 lbs. 6 oz.
Dahomey	25c	4 lbs. 6 oz.
Denmark	15c	4 lbs. 6 oz.
Ecuador	10c	4 lbs. 6 oz.
Egypt	15c	4 lbs. 6 oz.
Eritrea	25c	4 lbs. 6 oz.
Estonia	15c	4 lbs. 6 oz.
Ethiopia	25c	4 lbs. 6 oz.
Falkland Islands	10c	4 lbs. 6 oz.
Fiji Islands	25c	4 lbs. 6 oz.
Finland	15c	4 lbs. 6 oz.
France	15c	4 lbs. 6 oz
French Cameroons	25c	4 lbs. 6 oz.
French Equatorial Africa	25c	4 lbs. 6 oz.
French Guiana	10c	4 lbs. 6 oz.
French Guinea	25c	4 lbs. 6 oz.
French Indo-China	25c	2 oz.
French Settlements in India	25c	4 lbs. 6 oz.
French Somaliland	25c	4 lbs. 6 oz.
French Sudan	25c	4 lbs. 6 oz.
French Togoland	25c	4 lbs. 6 oz.
Gambia	25c	4 lbs. 6 oz.
Germany	15c	1 oz.
Gibraltar	15c	4 lbs. 6 oz.
Gold Coast Colony	25c	4 lbs. 6 oz.
Great Britain & N. Ireland	15c	4 lbs. 6 oz.
Greece	15c	4 lbs. 6 oz.
Guam	oz. 5c	70 lbs.
Hawaii	oz. 5c	70 lbs.
Hong Kong	25c	4 lbs. 6 oz.
Hungary	15c	4 lbs. 6 oz.
Iceland	15c	4 lbs. 6 oz.
India, British	25c	4 lbs. 6 oz.
Indonesian Republic	25c	4 lbs. 6 oz.
Iran	25c	4 lbs. 6 oz.
Iraq	25c	4 lbs. 6 oz
Ireland	15c	4 lbs. 6 oz.
Italian Somaliland	25c	4 lbs. 6 oz.
Italy (continental only)	15c	4 lbs. 6 oz.
Ivory Coast	25c	4 lbs. 6 oz.
Kenya and Uganda	25c	4 lbs. 6 oz.
Latvia	15c	4 lbs. 6 oz.
Lebanon	25c	4 lbs. 6 oz.
Liberia	25c	4 lbs. 6 oz.
Libya	15c	4 lbs. 6 oz.
Lithuania	15c	4 lbs. 6 oz.
Luxemburg	15c	4 lbs. 6 oz.
Macao	25c	4 lbs. 6 oz.
Madagascar	25c	4 lbs. 6 oz.
Madeira Islands	15c	4 lbs. 6 oz.
Malayan Union	25c	4 lbs. 6 oz.
Malta	15c	4 lbs. 6 oz.
Manchuria	25c	2 oz.
Mauritania	25c	4 lbs. 6 oz.
Mauritius	25c	4 lbs. 6 oz.
Mexico	oz. 5c	4 lbs. 6 oz.
Morocco (British)	15c	4 lbs. 6 oz.
Morocco (French)	15c	4 lbs. 6 oz.
Morocco (Spanish Zone)	15c	4 lbs. 6 oz.
Nauru Island	25c	4 lbs. 6 oz.
Netherlands	15c	4 lbs. 6 oz.
Netherlands Indies	25c	4 lbs. 6 oz.
New Caledonia	25c	4 lbs. 6 oz.
Newfoundland	10c	60 lbs.
New Guinea	25c	4 lbs. 6 oz.
New Hebrides	25c	4 lbs. 6 oz.
New Zealand	25c	4 lbs. 6 oz.
Niger	25c	4 lbs. 6 oz.
Nigeria	25c	4 lbs. 6 oz.
North Borneo	25c	4 lbs. 6 oz.
Norway	15c	4 lbs. 6 oz.
Nyasaland Protectorate	25c	4 lbs. 6 oz.
Palestine	25c	4 lbs. 6 oz.
Papua (Brit. New Guinea)	25c	4 lbs. 6 oz.
Paraguay	10c	4 lbs. 6 oz.
Peru	10c	4 lbs. 6 oz.
Philippines	25c	1 lb.
Poland	15c	4 lbs. 6 oz.
Portugal	15c	4 lbs. 6 oz.
Portuguese East Africa	25c	4 lbs. 6 oz.
Portuguese Guinea	25c	4 lbs. 6 oz
Portuguese India	25c	4 lbs. 6 oz.
Portuguese West Africa	25c	4 lbs. 6 oz.
Puerto Rico	oz. 5c	70 lbs.
Reunion Island	25c	4 lbs. 6 oz.
Rhodesia	25c	4 lbs. 6 oz.
Rio de Oro	25c	4 lbs. 6 oz.
Rumania	15c	4 lbs. 6 oz.
Samoa (U.S.)	oz 5c	70 lbs.
Santa Cruz Island	25c	4 lbs. 6 oz.
Sarawak	25c	4 lbs. 6 oz.
Saudi Arabia	25c	4 lbs. 6 oz.
Senegal	25c	4 lbs. 6 oz.
Siam	25c	4 lbs. 6 oz.
Sierra Leone	25c	4 lbs. 6 oz.
Singapore	25c	4 lbs. 6 oz.
Solomon Islands	25c	4 lbs. 6 oz.
Southwest Africa	25c	4 lbs. 6 oz.
Spain	15c	4 lbs. 6 oz.
Spanish Guinea	25c	4 lbs. 6 oz.
Straits Settlements	25c	4 lbs. 6 oz.
Surinam	10c	4 lbs. 6 oz.
Sweden	15c	4 lbs. 6 oz.
Switzerland	15c	4 lbs. 6 oz.
Syria	25c	4 lbs. 6 oz.
Tanganyika Territory	25c	4 lbs. 6 oz.
Thailand (now Siam)	25c	4 lbs. 6 oz.
Trans-Jordan	25c	4 lbs. 6 oz.
Tunisia	15c	4 lbs. 6 oz.
Turkey	25c	4 lbs. 6 oz.
Union of South Africa	25c	4 lbs. 6 oz.
U. S. S. R.	15c	4 lbs. 6 oz.
Uruguay	10c	4 lbs. 6 oz.
Vatican City State	15c	4 lbs. 6 oz.
Venezuela	10c	4 lbs. 6 oz.
Virgin Islands (U.S.)	oz. 5c	70 lbs.
West Indies	10c	4 lbs. 6 oz.
Yemen	25c	4 lbs. 6 oz.
Yugoslavia	15c	4 lbs. 6 oz.
Zanzibar and Pemba	25c	4 lbs. 6 oz.

China and Britain Sign Aviation Pact, Each to Operate Seven Lines

The Sino-British Civil Aviation Agreement was signed at the Ministry of Foreign Affairs recently, with British ambassador, Sir Ralph Stevenson, representing the United Kingdom, and Dr. Wang Shih-chieh, Foreign minister, representing China.

The four-year aviation treaty stipulates that seven airlines are to be operated by each nation.

The seven lines to be operated by China are:

(1) China to England via the Pacific and Atlantic.

(2) China to England and America via the Indo-China peninsula, Middle East, North Africa, and France.

(3) China to Calcutta.

(4) China to the Dutch East Indies via Penang and Singapore.

(5) China to Australia via Api, Labuan and the Dutch East Indies.

(6) Canton to Hongkong.

(7) Shanghai to Hongkong.

The British airlines are:

(1) London to China and Japan via Europe, North Africa and Asia Minor.

(2) London to China via the same route.

(3) Hongkong - Borneo - Philippines-Indo-China Peninsula.

(4) Singapore-Penang-China.

(5) Singapore to China via Borneo and the Philippines.

(6) Hongkong to Canton.

(7) Hongkong to Shanghai.

NEW STEAMSHIP BUILDINGS

St. Clair Building at 16 California Street now houses major Pacific Coast steamship organizations under one roof. Included are: Waterfront Employers Association of California and of the Pacific Coast; Pacific American Shipowners Association; Pacific American Steamship Association; the Accident Prevention Bureau; and various Rate Conferences.

Robert Dollar Building, 51 Canton Road, Shanghai, China. This eight story modern office building, constructed by Captain Robert Dollar and formally opened in 1922, is a center for shipping firms, importers and exporters, and other organizations engaged in building American trade abroad.

Robert Dollar Building at 311 California St. was built in 1919. The adjoining R. Stanley Dollar Building at 141 Battery Street has just been converted into a six-story office building with garage facilities. These buildings are a center for steamship, radio, marine insurance, admiralty lawyers and foreign trade and includes:

Anglo Canadian Shipping Co., American President Lines, Bechtel International Corp., Consolidated Steel Corp., The Robert Dollar Co., The Flintkot Co., Globe Wireless Co., Ltd., Heintz & Kaufman, Lillick, Geary, Olson, Adams & Charles, North Pacific Shipping Co., Pacific Far East Line, Pacific Mail Steamship Co., Western Pipe & Steel Co. of California, and Western Tank Car Company.

Globe's Shanghai — Manila Circuit Open

Globe Wireless Ltd. opened a new radio communications circuit between Shanghai, China and Manila, Philippines, July 7th, the 10th anniversary of the outbreak of the Sino-Japanese War. This circuit is operated by Globe Wireless in conjunction with the Chinese Government Radio Administration.

Globe Wireless signed a contract with the Chinese Government Radio Administration in October, 1941 for a direct Shanghai-Manila circuit. Just as the circuit was about ready to open, the bombing at Pearl Harbor and World War II put an end to communications in the Far East. Now almost 6 years later the service that was planned in 1941 is opening.

From San Francisco Globe Wireless has a direct radio communications circuit to Manila and another direct circuit to Shanghai. At present Globe engineers are building an automatic radiotype relay station in Manila to be used as a Master Station for other contemplated circuits in the Far East.

Radiotype, an exclusive Globe feature, has two distinct advantages: speed and accuracy, the message is typed only once, in the operating room where it originates, the entire transmission being automatic with the Radiogram arriving in the operating room of its destination typed on a delivery blank.

The Cahill Building on California Street near Battery is the latest in modern buildings along the financial section. Many insurance firms and shipping companies are located here including: Pope & Talbot, Inc., and the Marine Exchange.

Marine Insurance

DEFECTS IN INSURANCE DOCUMENTS

Today, some defect appears in two or three out of every five sets of shipping documents which exporters present with their drafts for payment under commercial letters of credit. The Irving Trust Company of New York lists the following defects in relation to marine insurance:

When insurance does not cover all the specific risks called for by the credit, or when a *certificate* is presented in cases where a *policy* is required, the credit conditions have not been met. And so also with other common complaints with insurance policies, as—

When the amount is insufficient. (Unless otherwise stated the insurance coverage should at least equal the invoice value *including* the insurance premium and all charges.)

When merchandise not properly described (particularly as to packing).

When the *date* when the insurance became effective is later than the date of the bills of lading.

When a complete set of insurance papers is not presented.

When corrections in the papers are not authenticated.

When carrying steamer's name not indicated.

When not countersigned or endorsed.

When not in negotiable form (unless otherwise authorized).

When transshipment not covered when bills of lading indicate transshipment will take place.

When brokers' cover notes are presented when not specifically permitted.

Many a draft has failed of collection because of the careless inadequacy of the documents.

The London Letter

By Our United Kingdom Correspondent

INTEREST IS ALREADY BEING SHOWN in the forthcoming Conference at Cannes in September of the International Marine Insurance Union. Carl Briner, president of the Union, announces that notices of the conference have been sent to 27 national and market associations. It may therefore be anticipated that this year's conference will be very fully representative of the principal marine insurance markets of the world. At the time of writing, it is not clear whether reports of the proceedings will be issued while the Conference meetings are taking place, or whether these will be held up until the delegates have returned to their homes.

A STANDARD ICE CLAUSE

"A Standard Ice Clause" is one matter which, it is suggested in London marine insurance circles, might be discussed at the forthcoming Cannes Conference—perhaps by a committee composed of the markets most closely concerned. Harold H. Mummery, underwriter and manager of the marine department of The London Assurance, and chairman of the Institute of London Underwriters, in his recent address to the Danish Insurance Institute at Copenhagen, touched upon the question of ice damage, and said that the best medium through which the various underwriting markets concerned could deal with the problem was to endeavor to frame an international agreement based on experience, and simple in application. Any complicated formula, Mr. Mummery added, was doomed from inception, so far as the British market was concerned. Denmark has her ice clause and her system of calculating additional premiums, and England has her Baltic warranty and scale of additional premiums. How, it was asked, could these two be married?

"It might be wise for British underwriters to review their Baltic scale of additional premiums, based on the experience of Scandinavian underwriters and with the advice of those who are so near to the problem."

It seems that, with the English and Danish clauses as a starting point of discussion, it should not be very difficult to arrive at a standard ice clause which would be acceptable to both English and Scandinavian markets, and it is suggested that this would, perhaps, be preferable to the Baltic warranty.

REPORTS OF BRITISH COMPANIES FOR 1946

Now that most of the leading British marine insurance companies have issued their results for the year 1946, it is possible to review, briefly, the outcome of the working. Marine underwriting was again very profitable (partly due to war risk premiums, which, although very greatly reduced, nevertheless made their contribution); partly due to the extra charges for marine insurance of hulls and cargoes imposed during the war, which were reduced, but nevertheless left a profitable margin, and in part due to fairly light total losses which, however, have increased considerably in the last few months.

The aggregated premiums of 25 leading companies for the year 1946 were nearly £22,000,000, and the underwriting profits, before tax nearly £6,000,000. This profit represents 27 per cent of the premiums for the year 1946. It is interesting to note that, although the premiums of these companies fell from £23,000,000 in 1944, to £20,000,000 in 1945, they increased last year to nearly the 1944 figures, due to the larger value of our overseas trade, the higher values and greater numbers of ships to be insured, and the re-opening of some foreign business and air risk insurance.

There is still, in the case of most companies, a considerable volume of the profits of previous years still held in the underwriting account, which can be brought out to equalize the position in the event of future bad years.

Argentine Marine Insurance Position

London marine insurance people find the Argentine marine insurance position a little puzzling. According to reports received here, the new Argentine insurance law has been enacted in very much the same form as that in which it was originally drafted, and which was thrown out by the legislature when it was first introduced some time ago. The stumbling block then was the difficulty which arose over the proposal that all imports and exports must be insured with Argentine companies, and it was thought that, on reconsideration, this provision would be modified to meet the circumstances which

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Admiralty Decisions

By HAROLD S. DOBBS
of San Francisco Bar

Mutiny

IN THIS DAY AND AGE we are prone to classify mutiny aboard ship as an episode of the past. We like to think of mutinies aboard ship as related to the days of the coal freighters or the days when a seaman was not treated as a human being but, to the contrary, was required to live under unbearable and difficult conditions. In this day of modern ships which are amply provided with good accommodations for the crew of every ship and when the food served to the crews is probably superior to that of most of our tables the average person finds it difficult to envision a rampant crew mutiny bound. It is probably true, however, that many episodes occur aboard ships today, and have in the immediate past, which might be classified as episodes of mutiny because certain members of a crew begin feeling sorry for themselves and conclude that they are being treated unfairly. We don't ordinarily hear of such mutinies because they are ordinarily quelled before too much damage has occurred. However, very recently the United States District Court for the District of Maine was required to determine a cause of libel filed by *Ioannis Mavromatis, et al., against the United Greek Ship Owners Corporation, et al.,* where certain members of the crew of the SS Naki alleged that they were entitled to certain damages as a result of the actions of the master. Eight members of the crew who were discharged by the captain and forcibly removed from the ship at Portland, Maine, sought damages, bonuses, etc., aggregating more than $120,000.

The *Niki* was sailing under the flag of Greece with a captain and crew of Greek citizens, but she was owned by the United States which had chartered her on a bare boat basis to the Greek Government which had, in turn, chartered her, with a Greek crew, back to the American Government for the carrying of American cargoes, in which business she was engaged at the time in question. The respondent, United Greek Shipowners Corporation, a Delaware corporation, was the agent in this country for the Greek Government.

The libellants' causes of action are based principally upon their alleged wrongful discharge from the ship. The respondent claimed that the discharge was justified by the conduct of the libellants, which is alleged to have been rebellious and insubordinate to the point of mutiny.

The ship, with a crew of thirty-nine, including the libellants and the Greek captain, had returned to New York from a trip to Yokohama and left New York for Bremen in April, 1946, reaching Portland from Bremen July 19, 1946. Supplies were being carried to the American armies abroad. At the beginning of these trips the eight Greek seamen who brought this libel organized themselves into a band which they called the "committee of the ship", practically taking charge of the vessel, refusing at times to obey orders of the captain and giving their own orders to the mate. They put the rest of the crew in fear, preventing them from obeying orders. Meetings of the crew were called by this committee and bodily injury was threatened those who did not attend. One man who kept away was assaulted. The assailant, being sent for by the captain for an investigation, sent word that he was "sleeping" and remained where he was. The next day the boatswain told the captain that he was afraid to ask this man to come aft. When in port these men left the ship when they pleased, disregarding the orders of the captain. They instructed the crew to bring their grievances to the committee instead of the captain, ordered the mate out of the wheelhouse, instructed the firemen when to work so that extra pay for overtime could be obtained, and generally were recalcitrant to the extreme, as claimed by the respondent.

It seems that this crew was "appointed" (as the captain put it) to the ship by the Greek consul in New York (describing himself as Director of the Mercantile Marine Department of the Greek Consulate), and on return from the trip to Japan the captain had reported the conduct of the men in question to the consul with a view of discharging them, but the consul directed the captain to keep them aboard 'till they could be taken to Greece

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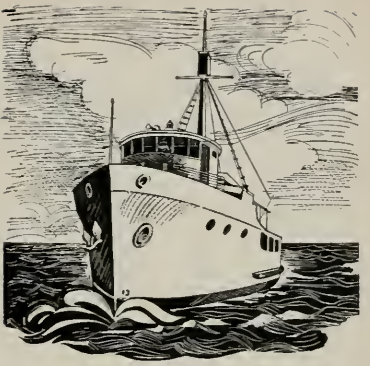
Coast COMMERCIAL CRAFT

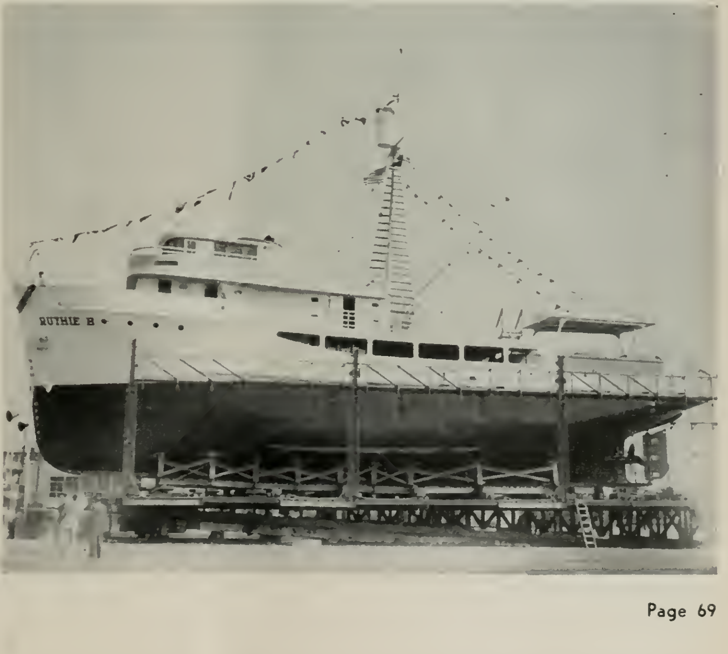


THE RUTHIE B

THE LARGEST STEEL CLIPPER ever built in San Diego Harbor the 110-foot *Ruthie B.,* was launched April 26 from the big new yard of the National Iron Works.

Owned by William H. Black, wealthy oilman, of Great Bend, Kansas, and La Jolla, California, the vessel is the seventh tunaboat constructed by National Iron Works, which has two more craft, both 106-footers, nearing completion.

Maiden voyage in May was high lighted by a ten-day "sportfishing shakedown," during which Black was host to several men prominent in public life, including Governor John Miles of New Mexico, and Municipal Judge A. F. Molina of San Diego. Others who made this trip into waters off the Mexican coast were C. Arnholt Smith, president of National Iron Works; Melvin N. Wilson, president of the U. S. National Bank, San Diego, whose friendship with Black led to the latter's interest in expanding his investments to the fishing industry; Pullman Lowden of Coronado, R. R. Matthews of Great



▲

The Ruthie B, sleek new 110-foot welded steel tuna clipper ready for her recent launching at National Iron Works' shipyard in San Diego.

▼

Bend, Kansas; and Courtney B. Davis and Virgil Browne, both of Wichita, Kansas.

The *Ruthie B.*, named for Black's wife, was launched auspiciously at ceremonies featuring Rear Admiral Calvin T. Durgin, commander of 11th Naval District air bases, as principal speaker. Mrs. Black was sponsor and Mrs. Wilson served as matron of honor.

John Morris, vice president of French Sardine Company, stressed the need, in his talk at the launching, for a continuing search for new tuna grounds to support the rapidly growing fleet. The *Ruthie B.* will fish for High Seas Packing Co., a subsidiary of French Sardine Company.

Captain Manuel Monise, of San Diego, will skipper the craft which has accommodations for a crew of 13.

The *Ruthie B.* has a molded beam of 27 feet, a molded depth of 13 feet, 2 inches, a height to the raised deck of 19 feet, 10 inches, and a fish capacity of 200 tons.

The fuel oil capacity is 27,491 gallons, providing a cruising range of 10,500 miles. A total of 1200 gallons of lubricating oil and 2300 gallons of water can be stored.

The entire refrigeration system was designed and furnished by the Baker Ice Company, Inc., of Los Angeles. Refrigeration compressors include three 5½" by 5½", two cylinder 20 h.p. machines; and one 2⅞" by 2¼", two cylinder, 3 h.p. machine for galley service.

Main engine is an Atlas six-cylinder Imperial diesel, single-acting, direct reversible, four-stroke cycle, 13" by 16", 315 rpm, supercharged to provide 55 bhp. It is equipped with a Kingsbury thrust bearing and is freshwater cooled by means of heat exchangers.

The auxiliary engines are Atlas six-cylinder Imperial diesels, 92 kva, 220 volt, 3 phase, a.c. generators direct-connected, 4-stroke cycle, 600 rpm non-reversible, 112 bhp.

Pumps include two 10" Fairbanks-Morse verticle bait pumps; ten 2½" Consolidated Pump & Engineering brine circulating pumps with 2 h.p. motors; one 2" Worthington Fire Pump with 5 h.p. Worthington motor; one 3" Carver Brine Transfer Pump, Type "H", with 5 h.p. motor; and one 3" Carver, Type "L", bilge pump with 5 h.p. motor.

Electric service is 220-volt, 3 phase, 60 cycle, a.c. power wherever required, with 110-volt single phase, 60 cycle, a.c. lighting current throughout the ship.

The *Ruthie B.* is built of electric arc welded steel, with a raked beam and a modified tuna vessel stern. It is subdivided with five transverse oil and watertight

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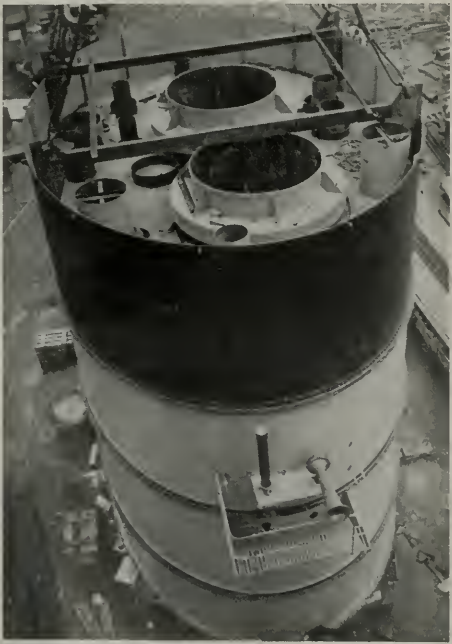
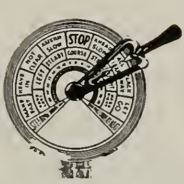


INSIDE STORY OF A STACK

Camera offers rare glimpse of complex paraphernalia that nestles inside streamlined funnel of Cunard White Star's new 14,000-ton Media. Ready for installation on sleek new combination passenger-cargo ship, the 45-ton funnel has just been bedecked in Cunard's familiar red and black colors. Workmen at front of base give clue to size of towering stack. The Media will sail Aug. 20 on her maiden voyage from Liverpool to New York.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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CURRENTS OF THE WORLD

(This is the third of a three-article series dealing with the tides and currents of the world. In these articles "The Skipper" has endeavored to present, briefly and rather informally, the basic knowledge, re these subjects, that the practicing deck officer should possess. Questions and suggestions concerning further articles of this type are welcome.)

Types of Currents

OF VITAL INTEREST TO ALL DECK OFFICERS are the currents of the world, with most navigators being familiar with the use of current tables and able to interpert current indications from a pilot chart. Through experience and study, however, the competent navigator will build a knowledge of the various tides and currents of the world much broader than the ability to refer to tables and charts. A thorough knowledge of currents has served many a navigator in good stead as a foundation to inspire a more complete study of the subject to deck officer readers. It will be understood that limitations of space prevent more than a summary of the subject in this column. In presenting this summary we may begin by dividing the currents of the world into two groups—those that are tidal in origin and those that are not, the latter group being called non-periodic currents. We will consider first the tidal currents.

Tidal Currents

(A) REVERSING (RECTILINEAR) Reversing currents are the type found in most inland waters, such as harbors, rivers, sounds, and bays. The water normally flows inward and up channels for a certain length of time and the turns and flows in the opposite direction for about the same length of time. Under normal conditions, with the tidal current flowing completely free, this would mean about 6 hours and 12½ minutes in each direction, because of the 24 hour 50

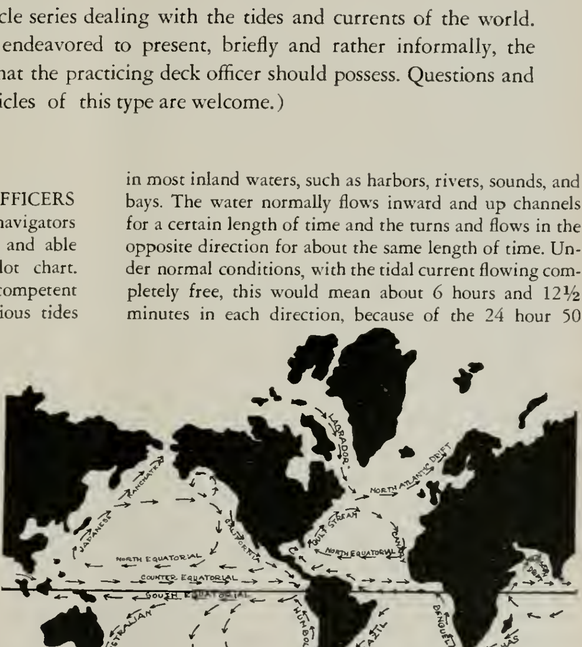


Figure 10.

minute length of the tidal day. Also the strength of the current would increase for about three hours to a maximum strength, then decrease for about three hours. At new moon, full moon, or when the moon is in perigee, just as the height of the tide will be higher, so the current will be stronger. The velocity of the current can be measured very accurately with either the current pole or the price current meter and is a matter of tabular record. The importance of knowing the velocity and direction of the current at the time the navigator is making a harbor is obvious when it is considered that in certain places the velocity of the reversing current may be as much as 11 or 12 knots. Through the Golden Gate it may be 3 or 4 knots, and through Hell Gate, New York, as much as 5 or 6 knots. The time of slack water is also of major interest to the navigator, and while it is truly just an instant, in ordinary usage and for all practical purposes the time of slack water is defined to be the period during which the velocity does not exceed one-tenth of a knot. This is a variable period, depending upon the maximum strength of the particular current and the location. In most places, however, with a 5 knot maximum current, the time of slack water under one-tenth knot velocity is about 5 minutes, and with a one-and-a-half knot maximum current velocity the time of slack water is extended to about 15 minutes.

(B) HYDRALIC

Hydralic currents are the type found in straits connecting two bodies of water. An example would be the current found in Deception Pass, Washington. This name is also given to currents in channels and passes open at both ends, like Long Island Sound. In these places, the current flows from both ends toward and away from a certain point, and because of the nature of the changing direction of flow may be a source of confusion to the navigator.

(C) ROTARY

As the name implies, these currents are rotary in character, and each normal tide time cycle of 12 hours and 25 minutes they will have changed their direction of flow 360 degrees, making a complete circle around the compass. Thus the over-all effect of the tide is nullified. These currents are generally of small velocity, and are found just offshore near harbor entrances. Because of the rotation of the earth, the rotary action is towards the right in the Northern Hemisphere and towards the left in the Southern Hemisphere, and by calculation we see that the direction of the current flow changes at about the rate of 27 degrees per hour. It is because of this rotary action that vessels anchor with the port anchor in the Northern Hemisphere and with the starboard anchor in the Southern Hemisphere, so that as the vessel swings the anchor cable always leads fair. These rotary currents are caused by the intersection of tidal currents acting in different directions, such as when currents following the coast line meet with currents coming into the coast at an angle, or meet with reversing currents. There is no slack water in a rotary current, and

(Please turn to page 100)

FIG. 11

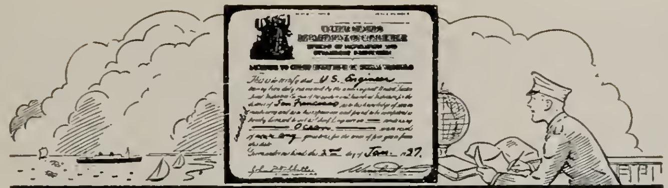
	SEPTEMBER					
DAY	SLACK; FLOOD BEGINS	MAXIMUM FLOOD		SLACK; EBB BEGINS	MAXIMUM EBB	
	Time	Time	Velocity	Time	Time	Velocity
	h. m.	h. m.	kn.	h. m.	h. m.	kn.
1 M	8 04 20 02	10 55 22 53	3.6 3.1	1 11 14 12	4 18 16 44	4.5 3.2
2 Tu	8 31 20 39	11 25 23 34	3.5 3.1	1 52 14 39	4 55 17 22	4.3 3.5
3 W	9 01 21 21	11 57 . ..	3.3 . .	2 30 15 03	5 36 17 59	4.0 3.8
4 Th	9 31 22 07	0 16 12 34	3.1 3.0	3 24 15 32	6 19 18 42	3.5 3.9
5 F	10 04 23 03	1 08 13 15	3.0 2.7	4 16 16 04	7 05 19 26	3.0 4.0
6 Sa	10 43 . ..	2 00 14 00	2.8 2.3	5 20 16 44	7 57 20 21	2.4 4.0
7 Su	0 06 11 37	3 03 14 53	2.6 2.0	6 35 17 37	8 58 21 21	1.9 4.0
8 M	1 16 12 46	4 13 15 56	2.6 1.9	7 51 18 42	10 01 22 25	1.6 4.1
9 Tu	2 32 14 16	5 32 17 09	2.6 2.0	9 08 19 55	11 12 23 32	1.5 4.3
10 W	3 39 15 32	6 43 16 16	3.2 2.3	10 10 21 10	12 22 . ..	1.7 . .
11 Th	4 36 16 32	7 41 19 21	3.7 2.6	11 02 22 14	0 37 13 27	4.6 2.2
12 F	5 28 17 26	8 33 20 21	4.0 3.3	11 46 23 11	1 37 14 17	5.0 2.7
13 Sa	6 15 18 18	9 17 21 13	4.2 3.7	12 26 . ..	2 30 15 03	5.1 3.3
14 Su	6 59 19 05	9 56 22 02	4.3 4.0	0 06 13 05	3 16 15 45	5.1 3.6
15 M	7 40 19 53	10 34 22 49	4.2 4.0	1 02 13 41	4 03 16 28	4.9 4.2
16 Tu	8 21 20 43	11 10 23 37	3.9 3.9	1 54 14 15	4 47 17 09	4.5 4.4
17 W	9 01 21 33	11 49 . ..	3.4 . .	2 47 14 51	5 31 17 50	3.9 4.4
18 Th	9 42 22 24	0 28 12 30	3.7 3.0	3 41 15 25	6 16 18 34	3.2 4.3
19 F	10 26 23 19	1 21 13 12	3.3 2.4	4 39 16 05	7 04 19 21	2.5 4.0
20 Sa	11 20 . .	2 14 13 56	2.9 1.6	5 43 16 46	7 57 20 13	1.8 3.6
21 Su	0 21 12 24	3 21 14 53	2.5 1.4	6 52 17 40	8 57 21 12	1.3 3.3
22 M	1 28 13 42	4 40 16 03	2.4 1.2	8 04 18 48	10 11 22 17	1.1 3.1
23 Tu	2 33 14 50	5 54 17 20	2.5 1.3	9 10 19 58	12 26 23 26	1.1 3.1

FIG. 12

Station or locality	Latitude	Longitude	Time difference	Velocity ratio	At strength of current: Flood interval	Flood direction (true)	Average velocity	Tropic velocity
	° ′ North	° ′ West	h. m.		h. m.	Deg.	Knots	Knots
San Francisco Bay, South	Time meridian 120° W.							
	Reference station, San Francisco Entrance, . 16							
Alcatraz Island, ¼ mile west of	37 50	122 26	−0 15	0.7	9 45	70	2.2	2.7
Alcatraz Island, south of	37 49	122 25	−0 25	0.5	9 35	95	1.7	2.1
Alcatraz Island, ¾ mile east of	37 50	122 24	−0 55	0.5	9 05	125	1.6	2.0
Yerba Buena Island, west of	37 49	122 23	−0 35	0.7	9 25	160	2.2	2.7
Treasure Island, ¼ mile west of	27 49	122 23	−1 35	0.7	8 25	165	2.2	2.7
Treasure Island, ½ mile north of	37 50	122 22	−1 15	0.5	8 45	135	1.5	1.8
Treasure Island, ⅓ mile east of	37 50	122 22	−0 55	0.7	9 05	140	2.1	2.6
Oakland Harbor, Webster Street	37 48	122 16	−1 30	0.3	8 30	120	1.0	1.2
Oakland Harbor, High Street bridge	37 46	122 13	−1 30	0.4	8 30	150	1.4	1.7
Rincon Point, ½ mile east of	37 47	122 22	−0 20	0.7	9 35	180	2.2	2.7
Rincon Point, midbay	37 47	122 21	−0 50	0.7	9 05	165	2.1	2.6
Alameda Ferry Slip, ¼ mile SW. of	37 47	122 20	−1 00	0.5	9 00	170	1.5	1.8
Mission Rock, ⅓ mile SE. of	37 46	122 22	−0 45	0.6	9 15	165	1.8	2.2
Potrero Point, 2 miles east of	37 45	122 20	−0 40	0.6	9 15	160	1.6	2.0
Point Avisadero, ⅛ mile north of	37 44	122 21	−1 40	0.5	8 20	125	1.6	1.6
Point Avisadero, ¾ mile east of	37 44	122 20	−0 35	0.6	9 25	160	1.6	2.2
Point San Bruno, 2 miles east of	37 39	122 20	−0 25	0.5	9 35	140	1.6	1.9
San Mateo-Haywards Bridge	37 35	122 15	−0 15	0.5	9 45	120	1.5	1.8
Marsh Point, 1 mile northeast of	37 33	122 11	−0 15	0.5	9 45	125	1.0	1.9
Dumbarton Point	37 30	122 07	−0 15	0.5	9 45	130	1.6	1.9
Calaveras Point, ½ mile south of	37 28	122 03	−0 15	0.3	9 45	135	1.0	1.2
San Francisco Bay, North								
Alcatraz Island, ½ mile north of	37 50	122 26	−0 25	f0.3 e0.6	9 35	75	f0.8 e2.0	f0.9 e2.0
Angel Island, east of	37 51	122 24	+1 05	0.4	11 05	350	1.2	1.5
Angel Island, Pt. Knox, 1 mile SW. of	37 51	122 27	−0 10	0.5	9 50	10	1.7	2.1
Raccoon Strait (Point Stuart)	37 52	122 27	−0 25	0.5	9 35	15	1.6	2.0
Southampton Shoal Light, ¼ mile E. of	37 53	122 24	+0 20	0.3	10 20	20	1.0	1.2
California City (off dock)	37 54	122 27	−0 10	f0.1 e0.6	9 50	330	f0.2 e1.9	f0.2 e2.5
California City, 1 mile east of	37 51	122 26	+0 20	0.5	10 20	335	1.5	1.8
Point Richmond, ½ mile west of	37 54	122 24	+0 15	0.3	10 15	335	1.1	1.3
Red Rock, east of	37 56	122 26	+0 15	0.4	10 15	320	1.4	1.7
Point San Quentin, 1½ miles east of	37 57	122 27	+0 40	0.4	10 40	5	1.3	1.6
San Pablo Bay								
Point San Pablo, midchannel ²	37 58	122 26	+0 45	0.7	10 45	30	2.3	2.6
Petaluma Creek entrance	38 07	122 30	+0 25	0.4	10 25	280	1.2	1.6
Pinole Point	38 02	122 22	+1 25	0.5	11 25	60	1.7	2.1
Oleum	37 04	122 16	+1 55	0.7	11 55	85	2.2	2.7
Carquinez Strait								
Mare Island Strait entrance, between dikes	38 04	122 15	+0 30	0.5	10 25	40	1.5	1.8
Mare Island Strait, off South Vallejo	38 05	122 15	+0 20	0.6	10 20	325	1.6	2.0
Crockett	38 04	122 13	+2 20	0.9	12 20	100	3.0	3.7
Benicia, south of	38 02	122 08	+2 30	0.6	0 05	80	2.0	2.5

San Francisco Bay Entrance (Golden Gate), Cal., 1947, Figure 11. This table of the Pacific Edition covers daily current predictions for 15 reference stations.

Figure 12. Table 2, Current Differences and Constants. This table furnishes data which will enable the navigator to determine the approximate time of slack water and strength of current at numerous stations on the Pacific Coast.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

MATHEMATICS FOR ENGINEERS

The cylindrical shell and strength of the riveted joint

IN THE JULY ISSUE we discussed the derivation of the formula for the AWP (allowable working pressure) and showed that it was simple applied geometry with a little algebra. We found that the formula was WRF=STE. This is the straight line arrangement and is the best way to memorize it. Usually it is required to know W, the working pressure. A simple transposition rearranges the formula to $W = \frac{STE}{RF.}$ S, strength of steel lbs. per sq. in. T, thickness of shell in inches; R, radius of shell in inches; F, factor of safety and E, efficiency of the riveted joint. We have now to discuss this efficiency and derive from simple mathematics the reasonable values.

Reference to U. S. Coast Guard "Green Book" page 68 indicates the theory of joint efficiency. Fundamentally it is the ratio of the strength of a definite length of the joint divided by the strength of an equal length of the shell plate. This ratio will always be less than one (or unity), because the plate will always be stronger than the joint. The holes drilled in the plate for the rivets weaken the plate because of the reduction of useful area.

Another fundamental consideration and one that confuses engineers is that instead of examining, studying or calculating the entire length of the joint in the longitudinal seam, only a short selected section of the joint is considered. There is good reason for this, however. The strength of the entire joint would be hundreds of thoucands of pounds. Why handle these large figures when the joint is really a definite pattern of repeated and exactly equal parts? We can calculate one of these equal divisions and what is true for one is true for all of them. The only requirement is to make sure that the part selected is equal to all other parts of the same length along the seam. This is shown in the accompanying blackboard sketches. When we study the strength of the plate between rivets of the second row, we may select a unit length or the joint equal to the distance between centers of the second row rivets. This is small pitch p, but when the outer row is studied the large pitch P is used, see Figure 3.

The third fundamental consideration is that all possible points of failure must be separately calculated and

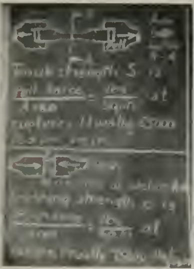


Fig. 1

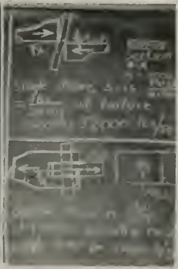


Fig. 2

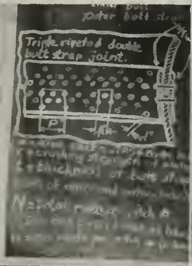


Fig. 3

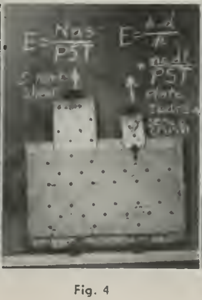


Fig. 4

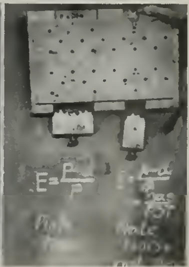


Fig. 5

the *one* having the *lowest* value of efficiency is used in our formula for working pressure. Marine Engineering Regulations require that four possible points of failure should be studied. Coast Guard examinations for license may require that only the two simple failures be calculated and the lowest value used. These two are the plate section and the rivet section, left side Figures 4 and 5. The plate section failure is as the term implies, a failure of the plate at its weakest point but without involving any failure of any rivet. The plate would tear on a line through the outer row of rivets. See accompanying sketch, Figure 5. The formula is: efficiency of the plate section, $E = \frac{P-d}{P}$. Notice that this is a ratio that expresses the reduction of the plate by the rivet holes. P—d is the distance between the holes (center to center distance minus hole diameter). It is the amount of good metal left after drilling the holes. The ratio of this good metal divided by the metal there before drilling the holes is the efficiency expressed as a decimal less than unity. Notice that it is not necessary that it introduce thickness of the plate here, or actual areas, because this ratio of distances is also the ratio of the areas as the same thickness would be used as a multiplier for both numerator and denominator of the fraction and thus cancels out.

For the rivet section the failure is supposed to be in a shear-off of the rivets,—all of them, and no part of the plate fails. See Figure 4. Here then we must study the strength of all of the rivets and divide this strength by the strength of the plate. The formula is for rivet section efficiency $E = \frac{N a s}{P S T}$. The shearing strength of the rivet (use double shear with double butt strap, single shear with single butt strap) multiplied by the area of the rivet, gives the strength of the rivet in shear. This times the total number of rivets in the unit length of joint selected, in this case large pitch P, gives total rivet strength of the unit section. Note that with three rows of rivets as arranged in the sketches there is a total of five rivets in the section. If the reader objects to the counting of four half rivets as two on the theory that a half rivet is less than half as strong as a whole one, let him select the dividing lines marking off pitch P so that they do not pass through a rivet but are still P inches apart. The strength of the plate in a distance of P inches is clearly the area of the plate here or P x T multiplied by the strength S of the steel. Thus PST is the strength of the plate in pounds in length P along the joint.

It is interesting to note here that if we decide to make the rivets "plenty" strong and make them larger in diameter we do indeed increase the efficiency of the rivet section. It would be possible to have an E here which is more than unity, such as 1.42 or some such figure. But when we come to calculate the efficiency of the plate section which results from these large rivets we find that we have reduced it to a very low value, perhaps to .47 or some such low figure. And, of course, we must use the lowest value of these several efficiencies in the working pressure formula. Therefore there is an optimum value of P and d which gives an efficiency for both the plate and the rivet sections equal in value. Much skill and experience on the part of the designers is required to give the best results.

Figures 1 and 2 are shown to refresh the memory regarding the simple conceptions of shear, compression, and tension forces and their evaluation. These are generally familiar to the marine engineer. The s for shear must be understood as being different for single and double shear. For double shear a value of twice that for single shear is used. It would have been better if the authors of the Regulations had not confused the engineer with two values of shear but instead had used a factor of 2 in the formula when double shear was involved. The crushing strength c of the steel of the butt strap may be a new conception to the engineer. Here the steel partly crushes and partly tears out. It occurs where the strap is thin as compared to the rivet diameter and where the rivet is close to the edge of the strap.

We now have to consider the compound failures possible. These are given as formulas (6) and (7) pages 68 of the Regulations. Also they are illustrated in Figs. 4 and 5, which show a model of a joint with the four possible failures broken out. For the combined failure of the plate at the second row of rivets and the shear off of a rivet, formula (6) of the Regulations and Fig. 5 apply. The plate strength efficiency is calculated as discussed above except that it is necessary to use the small pitch p as the length of the section under consideration. To the efficiency is added that of the rivet in shear. The strength of the rivet is the number of rivets in the outer row times the area of the rivet times the shear strength which in this case is double. Since the outer row is involved we must use big pitch P as a divisor when multiplied by steel strength S and thickness T.

Thus for a total we have efficiency of plate and rivet shear equals

$$E = \frac{p-d}{p} \quad \text{plus} \quad \frac{n a s}{P S T}$$

And lastly we have the combined failure of the plate at the second row of rivets and the butt strap crushing and tearing out. This efficiency is $E = \frac{p-d}{p}$ plus $\frac{n c d t}{P S T}$ Here we need not further discuss the first term as it is the plate efficiency of the previous formula. The area of the butt strap subject to crushing is obviously the diameter of the rivet hole times the thickness of the strap. With the inner and outer butt straps used as in Figure 3, thickness t is the sum of the two straps. Note, butt straps are not necessarily of the same thickness. See page 69 of the Regulations for minimum thickness. Multiply this area subject to crush by the crushing strength, double in this case, and by the number of rivets in big pitch P, which are involved in this crush, (in

(Please turn to page 104)

On the Ways

New Construction - Reconditioning - Repairs

BETHLEHEM QUINCY YARD RESTORES SS ANCON

Stripped of her wartime gear and fully restored to her former self the *SS Ancon,* well-known cruise ship of the Panama Railroad Company, during June received the last touches before leaving her berth at the Quincy Yard of the Bethlehem Steel Company.

The 10,000-ton ship was built at the Quincy Yard in 1939 and was engaged on the run from New York City to Haiti and the Canal Zone, carrying passengers and cargo when she was taken over by the United States Army on January 11, 1942.

No change has been made in the unique arrangement of passenger accommodations with a large number of the staterooms grouped around verandas, each of which provide a semi-private lounge for the four staterooms opening out upon it. This arrangement, which has proved so popular, was first introduced on the *Ancon* and her two sister ships, the *Panama* and the *Cristobal.*

In addition to the 32 veranda rooms, there are four de luxe rooms and 36 conventional staterooms. With the present arrangement these provide space for 227 passengers, all in one class.

The staterooms are all outside rooms, with cross ventilation and each equipped with a ventilating fan. They are all located midships, on the boat deck, promenade deck, and A deck, and they are furnished with all the comforts of a fine hotel, with private baths, pullman berths with foam rubber mattresses, full-length mirrors and large dressers with special compartments for hand luggage. Varying color schemes are used in the decoration.

Accommodations are also provided for 18 officers and a crew of 109. Most of the crew members are berthed two in a room, with a few rooms for three and four. The majority of these are on the A deck, aft.

In addition to staterooms the promenade deck is given over to public spaces. Unusually wide promenades extend fore and aft of the deck house. These are now enclosed by sliding glass windows in their entire length, whereas formerly only about half the length was so protected. The clubroom with the bar is at the forward end of the enclosure, followed by the large hall which runs through to the sun deck. This hall is connected to, and overlooked by the lounge on the sun deck, which appears as a balcony, or mezzanine, for the hall. When taken together the two rooms form one of the largest public spaces ever installed on a ship of this size. Aft of the hall the promenade deck extends across the ship and presents an area sheltered by the sliding windows. This area is used as deck cafe and dance floor. The open-air swimming pool is located aft on the boat deck. Generous deck areas surrounding the pool provide space for lounging and sun bathing.

The sun deck is given over to unusually large game and sport areas aft of the stack. These areas are free from obstructions such as ventilators, skylights and trunks. The dining room, located amidship on the B deck, seats 130 persons and extends the full width of the ship. The port and starboard levels are raised to give a balcony effect, and this effect is enhanced by bronze railings which skirt the outer edge of these sections. The dining room is sound-proofed and air conditioned for the ship's main refrigeration plant. In addition, there are five self-contained refrigeration units serving the writing room and all mess rooms.

A total of 292,413 cu. ft. of general cargo space is available in the five of the vessel's holds. The remaining

SS Ancon in her wartime garb anchored offshore. At right the SS Ancon restored to a cruise ship of the Panama Railroad Company. The Ancon arrived at the Boston Yard of the Bethlehem Steel Company in March of last year where the vessel was stripped of her war equipment. She arrived at the Quincy Yard on October 1, 1946, for conversion to her former status as a passenger ship.

DOCK'S BIGGEST LOAD

The 24,416-ton Italian liner Conte Biancamano, for six years the U. S. Army Transport Hermitage, on drydock at Bethlehem Steel Company's San Francisco Yard. 650 feet long, with a beam of 76 feet, the Conte Biancomo is the largest commercial ship ever to be docked in a floating drydock on the Pacific Coast.

When Italy entered the war, the vessel was seized at the Canal Zone on her way home from Chile. She has now been sold back to the Italian Government and will sail for Trieste around July 15 with an Italian crew of approximately 350.

Bethlehem's job is to put the vessel in shape for her return voyage. This will include drydocking, cleaning and painting her bottom, pulling both tail shafts and opening her machinery for inspection.

two holds, with 90,000 cu. ft. space, are arranged for carrying refrigerated cargo, and are equipped with mechanical conveyors for loading and unloading bananas.

When new, the *Ancon* was hailed as the safest ship afloat, virtually unsinkable and fireproof from stem to stern, with "nothing to burn but the fuel." These features have been retained. All furnishings are metal and other fireproof materials, and all hangings, rugs, draperies and similar materials have been flame proofed. The fire fighting equipment incorporates the latest developments in the field, and the ship has six aluminum life boats, two of which are motor driven and equipped with radio transmitters and receivers.

TODD CONVERTS NAVAL ATTACK TRANSPORT GOSHEN TO CANADA MAIL

WITH THE SAILING OF THE AMERICAN MAIL LINE 8008-ton *Canada Mail* from Hoboken, the Todd Shipyards Corporation Brooklyn Division marks the completion of a naval attack transport reconversion begun approximately six months ago. The 492-foot former APA-type ship was operated as the *Goshen* by the Navy from the time of her commissioning in December, 1944 until April, 1946.

This reconversion makes the vessel now a U.S.M.C. C3-S-A2 type, carrying 12 passengers, 55 crew members, and general cargo. For over a week before work could begin, a complete inventory had to be taken of considerable quantities of sleeping gear, spare parts, and miscellaneous supplies left on board when the Navy turned the vessel back to the Maritime Commission.

The ensuing change-over involved a complete stripping of all Naval equipment. Wartime radar equipment was replaced with commercial radar installed at the top of the single buff smokestack; the radio equipment was similarly exchanged; and heavy changes of the Naval electrical equipment and wiring had to be made to meet the entirely different specifications of the A. B. S. and USCG. All gun mounts were removed, and the deck plates in which hatch openings and holes for lines leading to these installations were replaced.

Numerous troop berthings in the cargo holds were all removed, and the holds completely altered to handle loading and storage of general cargo. The crew quarters were completely revamped to provide more spacious accommodations for considerably smaller peacetime staff. The lifeboat davits had to be changed from the Naval vertical leads on the deck, to the standard USCG horizontal leads above the boats.

The *Canada Mail* is the second ship of the American Mail Line readied since the war for the West Coast-Orient service, following the recent completion of the *Indian Mail*, also a reconverted APA-type. The line expects to have the *Java Mail*, another C3 in service soon, followed shortly by three standard freighters.

The *Canada Mail* was turned over to the owners by the Todd Brooklyn yards, and proceeded to Hoboken to load cargo. Upon completion of her maiden voyage, via the Panama Canal, the vessel will operate between Seattle and the Far East by the American Mail Line.

The Canada Mail leaves her Hoboken pier on her maiden voyage for the American Mail Line.

Running Lights

Edited by B. H. BOYNTON

DAVID

NORMAN

"BOB"

LILLEVAND,

Vice President

Grace Lines

GRACE

MARINERS BANQUET

IN SAN FRANCISCO

At top: S. E. Nelson, Terco Products Co., Alan Scurfield, Charles E. Lowe Co., and Louis Deppman, port engineer for Sudden & Christenson.

Second from top: Worth "Johnnie" Johnson, Republic Supply Co., Don Johnson, Smith-Rice Co., J. R. Williams, superintending engineer of Matson Navigation Co., and Bob Hall, naval architect for Matson Navigation Co.

Third from top: Lloyd Fleming, Pacific Coast Director, U. S. Maritime Commission, and Captain M. C. Stone, port captain for Matson Navigation Co.

Above: This group includes Frank W. Smith, Douglas Dickie, and Ed Graff.

At left, top: Captain Berry; Colonel John F. Aleure; Captain L. C. Olson; Captain F. P. Cotter; General Robert Wiley, manager, Board of State Harbor Commissioners.

Second photo: Johns-Manville table: T. S. Tulien; W. F. Anderson, manager of Bay Cities Asbestos Company; A. W. Knight and Evan Rinehart.

Third photo: John Cordes; Sewell Knapp; Fred Cordes, and Paul Joslyn.

Joe Gisler (center) is taking a ribbing from George Swett as Frank Smith, president of the San Francisco Society of Port Engineers stands by.

PORT DIRECTOR COMPANIES BEING ACTIVATED

San Francisco is among the first

Naval officers on inactive duty whose civilian or naval experience involved management of shipping, have been organized in San Francisco into units of the new Naval Transportation Service of the Naval Reserve program. Left to right, front row: Captain E. R. Vorencamp, USNR, C. O. Organized NTS, Company 12-1; Rear Admiral D. B. Beary, USN, Commandant, Twelfth Naval District; Captain Duncan Curry, Jr., USN, Port Director, San Francisco; Captain D. N. Cone, USN, Director of Naval Reserve, Twelfth Naval District. Standing (left to right): Cmdr. D. H. Harkleroad, USNR, Commanding Officer Volunteer NTS, Company 12-6; Comdr. E. H. Mishler, USNR, Commanding Officer Volunteer NTS, Company 12-3; Comdr. H. L. Haehl, Jr., USNR, Commanding Officer Volunteer NTS, Company 12-2; Captain A. G. Cooke, USN, Assistant Chief of Staff for Personnel, Twelfth Naval District; Captain A. H. Richards, USN, Assistant Port Director, San Francisco; Captain F. S. M. Harris, USNR, Commanding Officer Organized Brigade 12-2; Captain R. E. Hanson, USN, Inspector Instructor Naval Reserve, San Francisco; Comdr. T. Herbert, USNR, Commanding Officer Volunteer NTS, Company 12-1; Comdr. H. Clifford, USNR, Commanding Officer Volunteer NTS, Company 12-4; Comdr. C. E. Mynard, Jr., USNR, Commanding Officer Volunteer NTS, Company 12-5; Comdr. J. H. Wholley, USNR, Executive Officer, Organized NTS, Company 12-1.

Official U. S. Navy Photograph

MORE MARINERS

Left to right: R. L. Vinely, Weeks-Howe-Emerson; G. R. Vernon, Moore-McCormack; Dr. Gonzales, Guatemalan Vice Consul; L. M. Ammon, General Steamship Corp. Ltd., Purchasing Agent; G. E. Stevens, Olympic Steamship Co., Purchasing Agent; J. J. Imhof, Weeks-Howe-Emerson; Merl Johnston of Olympic Steamship Co., Port Engineer; M. J. Silva, Weeks-Howe-Emerson; and standing: Captain Sievers of Alaska Transportation Co.

WESTERN SHIP SERVICE EXPANDS

Jim Camp, general manager of Western Ship Service Company of San Francisco, announces the establishment of a new chemical division by his company. Arthur Zipf, former partner in the Eureka Chemical Company, is manager of the newly established department, which specializes in chemical cleaning of water jackets, boilers, and rotors, and in tank conversion.

NEW OFFICER

At the installation of new officers, Mrs. Harry W. Parsons turned the gavel over to the new helmsman, Mrs. John F. Johnston, for the 1947-1948 term of the Women's Organziation for the American Merchant Marine, Port of San Francisco

FRED SHINGLE PASSES

James Frederick Shingle, vice president, International Paint Co. (California) Inc., passed away July 22, at San Francisco.

◄

Members of the Bilge Club enjoying their annual barbecue dinner on July 5 after 18 holes of golf, tug-of-war and baseball. The barbecue was prepared by Dan Dobler, Hampton Neergaard, Joe Costello, Sam Capelle and assistants. Seven hundred members and guests were in attendance and the Palos Verdes Golf Course was in excellent shape. Bill Kane of Todd Shipyards won low net and the prize donated by Bethlehem Shipbuilding Co. Runners-up were Nick Trutanich and Don Montague. Winners in Class B were Walter Smith, Neil Anderson, Pascal Dilday, Otto Miller and Charley Bailey. Bilge Club president Walter Richards kept the day's events moving along while Sheriff Gene Biscailuz was in top form as master of ceremonies.

▼

Joe Hare, Southern California manager of the Maritime Commission and Wayne Johnson, San Diego Marine Construction Co.

Joe Dennis of Craig Ship and Harry Martin of Moore McCormack Lines.

Eugene Biscailuz, master of ceremonies, also Sheriff of Los Angeles County; Al "Little Flower" Boro of J. M. Costello Supply Co.; Earl Archibald, chairman of prizes, who is with Sunset Oil Co.

"On the Green."

Winn Rash, chairman of Finances, treasurer of Bilge Club, who is with California Bank; Bob Snodgrass, secretary of Bilge Club; Earl Archibald, and Edward Kellenberger, with R. C. Griffith Co.

Charlie Houghton, extreme right, Chairman of the Day. The Winning Team on the business end of "Tug-of-War."

Losing team right in there tugging.

BILGE CLUB'S ANNUAL BARBECUE AND GOLF TOURNEY

THE BLIMP WITH THE "FLYING RED HORSE"

General Petroleum's "Flying Red Horse" dirigible at night showing animated electrical horse, 45 feet high and 50 feet long.

This intricate wiring enables the "Flying Red Horse" to kick his feet. Taken at Moffett Field during installation.

Bearing on its sides the largest electrical display ever seen in the west, General Petroleum Corporation's spectacularly lighted dirigible, the "Flying Red Horse", is currently making daily and nightly flights over Pacific Coast cities and is arousing unusual interest in marine circles because of the varied services it makes available.

Recently converted to commercial use after more than 3,000 hours of anti-submarine and convoy patrol duty during the war, the former Navy airship L-12 is still prepared to perform its offshore functions on a moment's notice. Completely manned by Navy-trained lighter-than-air veterans, it is authorized to depart from its scheduled flights and proceed in case of emergency to any place within its flying range where a ship in distress may need its rescue or observation facilities.

At ceremonies celebrating the airship's arrival in northern California, and attended by James S. Hines, publisher of Pacific Marine Review, other advantages of the dirigible's commercial use were pointed out by Clarence S. Beesemyer, vice president and director of marketing for General Petroleum.

"The Navy encourages such use of its former wartime airships by business firms," Beesemyer revealed, "not only because it thus keeps in operating condition dirigibles which otherwise would have to be dismantled and the rubber sold for raincoats and similar use, but also because it thus maintains a reserve of trained Navy crews, ready for emergencies."

The electrical display on the sides of the ship consists, in addition to the words Mobilgas and Mobiloil in large white letters, of huge red horses which flap their wings and kick their feet. The horses are 45 feet high and 50 feet in length and employ nearly 9,000 electric lights.

After making its first Pacific Coast appearance in southern California, the big airship moved north for a visit in the San Francisco area and then proceeded to the northwest for stops in Portland, Seattle and other cities in that region. It is slated to return to northern California in October for a 7-week stay and will then move south to Los Angeles again.

Seated, left to right, they are: James S. Hines, publisher of Pacific Marine Review, San Francisco; S. T. Couch, manager of marine sales for General Petroleum Corporation, Los Angeles; John R. West, president of West-Marquis, Inc., General Petroleum's advertising agency, Los Angeles; Clarence S. Beesemyer, vice president and director of marketing for General Petroleum Corporation, Los Angeles; Richard Dick, vice president of Western Air Lines, Inc., Los Angeles; James L. de Pauli, manager of the San Francisco office of West-Marquis; and William G. Nostrand, executive engineer of Winslow Engineering Company, Oakland.

WALKING BOSS SAFETY DINNER AND TROPHY PRESENTATION

RESUME OF COLUMBIA RIVER DISTRICT

The dinner meeting was held at the Multnomah Hotel in Portland, Oregon on June 19, to further stimulate the interest in safety on the waterfront and for the presentation of the Byron O. Pickard Memorial Safety Trophies to the stevedore and terminal companies having the lowest compensable injury frequency for 1945 and 1946 in the five-year Safety Contest. Direct employers, superintendents and walking bosses were present.

The chairman, Captain J. A. Hazelwood, manager of Williams-Dimond Company, introduced Paul Faulkner of the Pacific Marine Review, sponsors of the Columbia River District On-Shore Stevedoring Trophy, which was awarded to Brady-Hamilton Stevedores, Inc., for the lowest on-shore stevedoring compensable frequency for the two years of 1945 and 1946. The trophy was presented to J. W. Hubbard, operating manager. Mr. Faulkner indicated the appreciation of his company's participating in the furthering of safety on the waterfront, and as a publisher, had taken an active interest in matters of marine safety since the inception of the program on the Pacific Coast. Mr. Faulkner presented the trophy and commended Mr. Hubbard and all other personnel of his company for *also winning second place in the Pacific Coast On-Shore Stevedoring Safety Contest.* Mr. Hubbard accepted the trophy with a word of appreciation in the name of the company and of William (Bill) Brady, president of the firm, who was in the hospital and unable to attend. Mr. Brady has been very active in stevedoring circles in the Northwest and is one of the old timers of the waterfront.

As a safety message to all concerned, Don A. Willhite, district supervisor, Accident Prevention Bureau, said: "In consideration of the substantial and continuous overall reduction of injuries achieved on this coast we should not be satisfied with our present score, even though our measure of improvement cannot be matched by any coastal section of this country. It was also pointed out that while we may have general problems that are identified with our industry, nearly all the hazards encountered in longshore work are common to other industries; but some other industries have achieved far more success in controlling these hazards. . . ."

Upper left: Paul Faulkner, Pacific Coast Advertising manager, Pacific Marine Review; A. M. Schoenfeldt, branch manager, Employers Mutual Life Ins. Co. of Wisconsin; Captain Hazelwood, Chairmen of Meeting, vice chairman of Columbia River District Accident Prevention Committee, manager of Williams-Dimond Co.; Les Petersen, safety engineer, Marine Electric Co.; Gregg Hirsch, secretary, Brady-Hamilton; J. W. Hubbard, operating manager, Brady-Hamilton; D. A. Willhite, district supervisor, Accident Prevention Bureau of the Waterfront Employers Association of the Pacific Coast.

Upper right: Gregg Hirsch, H. W. Hubbard, Toy Rentala, dock foreman, Brady-Hamilton, Paul Faulkner, W. C. Cherrick, assistant operating manager, Brady-Hamilton; F. J. Girt, walking boss, Brady-Hamilton, and Albert Swanson, walking boss, Brady-Hamilton.

Lower left: Gregg Hirsch, J. W. Hubbard, Toy Rentala, A. M. Schoenfeldt, R. M. Dinwiddie, safety engineer, Employers Mutual Life Ins. Co. of Wisconsin, Albert Swanson, W. C. Cherrick, and F. J. Girt.

Lower right: D. A. Willhite, Les Petersen, Captain Hazelwood, and Roy Wise, manager, Interstate Terminals.

SEA-AIR

Ship Chandler Enters Aviation Field

In tune with a trend for shipping interests to acquire related aircraft services, comes the announcement that the pioneer C. J. Hendry Company now carries extensive line of of aviation hardware, and is completely equipped to offer hardware sales-service to the flying trade.

To enter into this highly specialized field on a permanent basis has taken no little amount of study and research, but the 80-odd years experience of Hendry in the supply field in addition to considerable special experience in aviation hardware as an agent of the WAA form a solid foundation for a permanent business in this line.

Already doing a good volume of business out of San Francisco to all parts of the world, plans call for expansion to outlets along the entire Coast, Alaska, and the Hawaiian Islands. The company based its first three months' operations on a strong service policy, and the wisdom of this decision has already paid dividends in the firm volume already built up.

Unique Staff

A feature of the Aircraft Division's staff is that it is entirely composed of personnel with aircraft and aircraft hardware experience. It is headed by C. Charles Crawford, a well-known figure in aircraft circles Crawford began his aviation career at Douglas, then with Matson's Air Transport Division and was assistanr general manager of the Aviation Maintenance Corp. Similarly other members of his staff draw on wide and long experience with aviation, and more specifically aviation hardware. S. R. Johnstone is assistant manager in charge of Sales, former pilot in the Army Air Forces. Roy Sullivan, the golfer of the Aircraft Division, was a former pilot, instructor and Liaison Officer in the USAAF, and is now a salesman. William A. Robertson, Jr., former Major in the Army Air Forces with extensive background in aviation maintenance, is a salesman with the Aviation Division. Thomas Stewart was in charge of aviation hardware on USS North Carolina during the war. T. A. Bulotti's past experience in the aviation field has been with Curtiss-Wright Flying Service, Pan American Pacific Division, both on the Pacific Coast and in Manila, P. I., and at the main base at the San Francisco Municipal Airport. Herbert W. Solmsen, office manager, has extensive foreign experience. During internment in China at the start of the war he was able to manage a large radio sales and service company, and when U. S. Troops moved in he worked for the China Service Command and the Military Advisory Group in Nanking.

C. J. Hendry's new division is confident of building up a volume with all commercial aviation companies that will rival the ship-chandlery division, the largest on the Coast.

At top, reading down: C. Charles Crawford, general manager; S. R. Johnstone, William A. Robertson, Jr., and Roy Sullivan, and Tom Stewart.

At left: T. A. Bulotti and Herbert W. Solmsen.

Basil Harris In San Francisco

◀ Basil Harris,
Chairman of Board,
United States Lines

▶ Stephen D. Bechtel,
Director,
United States Lines

At a recent luncheon in San Francisco Mr. Harris reviewed the problems of the Maritime industry, and came up with some ingenious solutions.

Mr. Bechtel, at the same meeting, spoke inspiringly of the prospects for industry and world trade.

Walton Is Bank Director

At a meeting of the board of directors of Crocker First National Bank of San Francisco held July 10, Sydney G. Walton, vice president of Matson Navigation Company, was elected a director of the bank.

Mr. Walton, a graduate of the Massachusetts Institute of Technology, class of 1923, is well-known San Francisco business executive, having been associated with the Matson Navigation Company for over 20 years. He is presently in charge of passenger and air operations for the company, and is president of the Matson Aviation Maintenance Corporation. He is also a director of United Engineering Co., Ltd.

Hyde Windlass Appoints Wm. H. Schultze

Effective July 1, the Hyde Windlass Company, Bath, Maine, appointed William H. (Bill) Schultze to be in charge of their new Philadelphia office, according to an announcement by Rodney E. Ross, president. Bill Schultze is well known in marine circles for his knowledge of deck machinery requirements, and its operation.

Martin and Turner Represent Plate Glass Firm

The Pittsburgh Plate Glass Company, paint division, announces the appointment of Martin & Turner as exclusive distributors of Pittsburgh marine paint finishes in the San Francisco and Los Angeles harbor areas. Martin & Turner offices and warehouse stocks are located at 314 Wilmington Boulevard, Wilmington, and at 134 Sacramento Street, San Francisco. Eric Pedley is manager of the San Francisco branch of the company.

The Pittsburgh line of marine finishes offers a wide range of prestige building colors to serve decorative, as well as functional purposes.

L. L. DeWolf Promoted By Babcock & Wilcox

The appointment of L. L. DeWolf as Superintendent of Marine Erection was announced recently by The Babcock & Wilcox Company, manufacturers of steam generating equipment. He succeeds M. Nielsen, who becomes Production Superintendent of the company's Barberton (Ohio) Works.

Mr. DeWolf has been Assistant Superintendent of Marine Erection since 1941 when he came to the New York Office from the Marine Engineering Department in Barberton. He joined the company in 1929 in the Engineering Division, and later was transferred to the Marine Engineering Department.

A graduate of Oberlin College, Mr. DeWolf did post graduate work in engineering. He is a member of The Society of Naval Architects and Marine Engineers. His home is in Chatham, N. J.

L. L. DE WOLF


IN EVERY CLIME AND CONTINENT...


BENDIX
SCINTILLA

Pacific Marine Review

NEWS FLASHES

GREAT NEW PROJECTS IN THE WEST

World Trade Center at San Francisco.

The California legislature has passed and Governor Warren has signed a bill providing the way for the proposed $35,000,000 World Trade Center at San Francisco. The Project will cover nine city blocks in the downtown area now occupied largely by the wholesale produce district.

* * * * *

WORLD TRADE FREE PORT AT SAN FRANCISCO

Approval is hourly expected from Washington of the long planned "free zone" for the processing of inbound dutiable cargo at San Francisco. The site will temporarily be at pier 45.

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ALAMEDA SCHOOL CONTINUES

The United States Maritime Academy at Alameda, California, has been approved for continuance. Up to the closing days of Congress, the school's future was uncertain.

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ANNAPOLIS OF WEST AT DEL MONTE

Congress approved in its closing days the purchase of the historic Hotel Del Monte property near Monterey, California, for a post-graduate academy for the Navy. Occupation is expected January.

* * * * *

I.L.O. AT SAN FRANCISCO

"Selection of San Francisco as site of the 31st conference of the International Labor Office is a great tribute to San Francisco's position as a world city," says Carl J. Eastman, president of the San Francisco Chamber of Commerce. The I.L.O. Conference, now meeting in Geneva, will open in San Franciscco June 17, 1948.

* * * * *

ENTERPRISE ENGINE ACQUIRES COMPLETE LINE OF HENDY DIESEL ENGINES

C. S. Herbert, executive vice president of the Enterprise Engine & Foundry Company, of San Francisco, California recently announced that the company has acquired the complete line of Hendy marine and stationary diesel engines formerly manufactured by the Joshua Hendy Iron Work of Sunnyvale, California.

* * * * *

INTERCOASTAL LINES RESUMING

Practically all of the prewar intercoastal lines have announced sailing under private operation. The last few days have brought announcements from American-Hawaiian, Pope & Talbot, Arrow Line, Weyerhaeuser, Isthmian, Calmar, Panama-Pacific, and Luckenbach. The Maritime Commission made positive announcement on July 10 that General Agency arrangements would not be resumed.

NEW SHIP REPAIR AWARD TO CONSOLIDATED STEEL CORPORATION

Philippine Consolidated Shipyards, affiliated with Consolidated Steel Corporation, has a contract covering the repair of small Army vessels at Manila and Cavite, Philippine Islands. Several thousand Filipinos are currently employed, with more than 100 American supervisory personnel, including technical and administrative staff, engaged upon the job.

Philippine Consolidated Shipyards completed this month ahead of schedule a similar contract for the Navy Department, covering the repair of Navy tugs, barges, landing craft, and other small vessels at Samar in the Philippine Islands.

* * * * *

APL TAKES ANOTHER SHIP

Because of continuing heavy demand for passenger space over its Trans-Pacific route, American President Lines will charter from the U. S. Maritime Commission the SS MARINE SWALLOW, a C-4 vessel having accommodations for 968 passengers.

* * * * *

SEATTLE PROGRAM

Leading Alaska, trans-Pacific and intercoastal steamship lines, transcontinental airlines and other public carriers, export-import, manufacturing and shipping interests will collaborate with the Port of Seattle Commission in a long-range foreign commerce promotion program. E. H. Savage, port president, announces.

An annual goal of at least 10,000,000 tons maritime cargo for Seatle would result in more than $50,000,000 yearly payrolls for Seattle, an increase of 40 per cent.

* * * * *

MANY SHIPS IN FOR REPAIRS

The steady parade of ships to West Coast yards continues. July 31 showed 15 vessels in Bethlehem's San Francisco yard. The included:

VESSEL	OWNERS OR AGENTS	
Dredge HOLLAND	U. S. Engineers	Overhaul
ESSO PORTO ALEGRE	Std. Oil Co.	Drydock & Repairs
ESSO RIO GRANDE	Std. Oil Co.	Drydock & Repairs
BESBORO	Pillsbury & Martignoni	Conversion & Repair
CONTE BIANCAMANO	Genl. S. S. Co.	Survey & Repair
KATHIO	Deconhil S. S. Co.	Hull Alterations
ATASCOSA	Pacific Tankers	Repair & Conversion
Barge YF#618	Generaux & Hansen	Hull Repairs
HAROLD L. WINSLOW	Genl. S. S. Co.	Voyage Repair
HUBERT PROM	French Shipping Mission	Conversion & Repair
SAINTE HELENE	French Shipping Mission	Conversion & Repair
FALKANGER	Westfal Larsen Line	Miscl. Repair
COLGATE VICTORY	A. P. Lines	Voyage Repairs
HERANGER	Interocean Line	Mach. & Elect. Repairs
DENISON VICTORY	Moore-McCormack Lines	Routine Drydock

JUNE INDUSTRIAL EXPANSION--NORTHERN CALIFORNIA

Fifty-three new plants and 22 factory expansions for the Bay Area and Northern California to cost $6,640,500 were tabulated during June.

Industrial development gains for the first half of 1947 show 300 new plants for Northern California to cost $36,745,400 and 195 expansions aggregating $27,573,300, for a total of 495 projects to cost $64,318,700. Bay Region (12 counties) projects for the same period account for 239 of the new factories as $26,153,900 and 151 of the expansions for $24,883,800, a total of 390 projects to cost $51,037,700.

* * * * *

JUNE INDUSTRIAL DEVELOPMENT--SOUTHERN CALIFORNIA

During the month of June, 19 new factories were established in Los Angeles County with a total investment of $597,000, and creating 204 new jobs for factory workers. Thirty-three (33) existing plants were expanded, calling for an additional investment of $8,527,500 and creating 2,097 new industrial jobs.

Total investment in the 52 new and expanded units was $9,124,500, creating a total of 2,301 new jobs.

During the first six months of 1947, 110 new factories were established with a total investment of $34,259,000, and creating 4,230 new jobs; 196 existing plants were expanded, calling for an additional iinvestment of $26,966,000, and creating 7,864 new industrial jobs.

* * * * *

JUNIOR MEMBERS OF NAVAL ARCHITECTS

The Society of Naval Architects and Marine Engineers has announced that 455 Cadet-Midshipmen stationed at the United States Merchant Marine Academy, Kings Point, New York, have been elected to Junior Membership in the Society.

* * * * *

TRANSPORT CONVERSION

The USAT Admiral W. L. Capps has been selected for conversion into a permanent Army transport at the Newport News Shipbuilding and Drydock Company.

At Newport News the Admiral Capps will join three other P-2 type troop carriers of the San Francisco Port of Embarkation fleet--the Admiral Eberle, Admiral Hughes and Admiral Benson.

It is expected the ships will return to troop-carrying service in the Pacific early in 1948.

In addition to the four P-2's, San Francisco Port also has scheduled two C-3's, the USATs Fred C. Ainsworth and David C. Shanks for conversion at the Bethlehem, San Francisco. They are to come in for the work in late August and September.

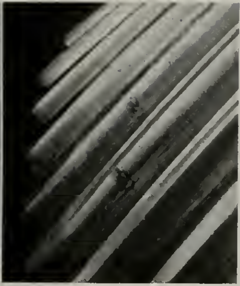
* * * * *

MARINE RADIO REPAIR DEPOT

A complete marine radio repair depot has been opened at Manila, Philippine Republic, by the Marine Division of the Mackay Radio and Telegraph Company.

The depot is another link in an international chain of marine service stations and agencies maintained at 152 principal ports by Mackay and its associated companies throughout the world for repairs and maintenance to all types of marine radio communication, direction finding and other shipboard electrical equipment.

Severe wear shown on these reduction gears was attributed to improper cleaning prior to change of turbine oil.



Inadequate cleaning at time of initial turbine and oil installation led to scoring of these new gears by abrasive particles.

not otherwise cleaned. Such washing is quite effective in removing deposits.

On new installments it is sometimes necessary to bypass or install jumpers around bearings and governor system during the initial stages of cleaning to prevent possible washing of scale and metal chips into these parts. Engines should not be jacked over while cleaner is being circulated because of the low viscosity of these products.

It is recommended that cleaner be circulated through the various purifier lines. After cleaning has advanced enough so that the duplex strainers do not take out any more dirt, cleaner may be circulated through the governor oil lines, with the governor mechanism being manually worked during such circulation.

Once it has been decided that the cleaner has done its job, it should be promptly and completely drained and pumped from the system. In order to remove all cleaner from the bottom of the sump tank, and from pockets formed by the webbing of reduction gears, the use of a portable pump having powerful suction may be necessary. All places where cleaner can collect during circulation should be examined and pumped dry. Small amounts of cleaner dilute the displacement oil mentioned below and reduce its effectiveness. The used cleaner may be saved and reused until it is no longer effective.

F. E. Potter, engineer superintendent of India Steamship Company, and K. T. Connell and J. F. Keenan, Shell marine representatives, examine duplex magnetic strainer on a Victory ship during process of cleaning turbine oil system.

Following removal of the cleaner, enough lubricating oil to be pumped throughout the oil system is used to displace the cleaning solvent. This displacement oil should preferably be new turbine oil of the same type to be used as final charge. If, however, enough used turbine oil is available which is clean and not excessively deteriorated, it may serve if necessary. The same circulation procedure is followed for the displacement oil as was followed for the cleaner, except that circulation need be for only three to six hours. During this period the turbine should be jacked occasionally ahead and astern. Removal of displacement oil should be very thoroughly done, and the used oil may be employed as general machine (non turbine or internal combustion engine) oil. All drains on tanks, pumps, coolers and lines should be opened and completely drained. It is recommended that all tanks and other accessible places be hand wiped with lintless cloths, and the entire system finally inspected for freedom from all foreign matter and oil. Once the system is clean and dry, the final oil charge is pumped in and circulated.

Laboratory examination of displacement oil is helpful as a guide indicating amount of dilution by cleaner, and to determine that the system is clean and ready to receive the final charge. The latter is tested completely to confirm that all specifications are met.

India Steamship Company Cleaning

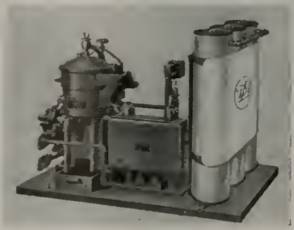
The recent cleaning of four VC2-S-AP3 type ships for the India Steamship Corp. of Calcutta was successfully accomplished at the Todd Shipyards Corporation, Los Angeles Division. All four vessels had been laid up after extensive wartime service and inspection showed varying amounts of sludge, lacquer and oxidized oil. Two of them had preservative compound in the turbine oil system. F. E. Potter, engineer superintendent of India Steamship Company, desired that maximum cleanliness be attained with the minimum of dismantling and manual cleaning of inaccessible areas. Preliminary tests indicated Shell Turbo Cleaner fully capable of removing impurities mentioned above. Shell Turbo Cleaner is the brand name of high solvency petroleum turbine cleaner manufactured by Shell Oil Company, Inc.

It was therefore decided that all four oil systems should be cleaned in connection with general overhaul and reconversion of the ships themselves, and that a highly solvent cleaner should be employed to remove the deposits left by the oils previously used. Cleaning

(Continued on page 104)

KEEP POSTED

New Equipment and Literature for Yard, Ship and Dock



The De Laval "Puri-Filter," Model No. 45

NEW DE LAVAL PURI-FILTER

New equipment for maximum protection of diesel engines was recently offered to diesel engine operators by The De Laval Separator Company.

The De Laval "Puri-Filter" will enable the diesel operator to secure the advantages of purifying diesel lubricating oil by centrifugal force and by positive filtration. Heretofore he has been forced to choose between centrifugal force, which removed most solid impurities and all water, and filtration which in cleaning the oil also restored a good measure of color but which provided no protection against water. With the "Puri-Filter", diesel lubricating oil can be maintained both *clean* and *dry*—the maximum protection for every engine.

The De Laval "Puri-Filter" combines a De Laval "Uni-Matic" continuous centrifugal, complete with dirty-oil and clean-oil pumps, with two or more Fram Micronic Filters. In addition, a thermostatically controlled noncarbonizing heater, and all necessary inter-connecting piping and wiring are furnished. The entire unit is compactly mounted on a sturdy structural steel base. To place the "Puri-Filter" in operation, it is only necessary to make connections to the oil sump and to the power supply. For the first time, the diesel operator can continuously purify and restore his lubricating oil to "like-new" quality and appearance.

The centrifuge is fitted with the De Laval constant efficiency disc type bowl, most effective means of utilizing centrifugal force as a purifying agent ever devised. The filter unit is a low-cost porous cellulous cartridge which will remove all solid particles down to one micron (0.000039 inch) in size.

The advantages of keeping lubricating oil in good condition by this means are manifold:

The "Puri-Filter" removes dirt and water by centrifugal force; it also removes harmful carbon by filtration. The "Puri-Filter" will not, however, remove valuable additives. Thus, the operator is enabled to maintain his lubricating oil without sacrificing any of the improved qualities made possible by present-day refining methods.

Oil can be cleaned at moderate temperatures, with the result that its stability is not impaired—the oil does not tend to break down and oxidation is not unduly hastened.

Oil life is increased by being constantly kept "like-new" and hence the total cost of oil over a period of time is reduced. Another important advantage is that ring sticking and bearing wear are minimized—are, in fact, practically eliminated.

Crankcase inspection is facilitated inasmuch as when the "Puri-Filter" is installed in the lubrication system of an engine it is not necessary to clean out the crankcase at the time periodic inspections are made. Since engine crankcase inspection is traditionally a messy operation, unpopular with the operating personnel, the use of the "Puri-Filter" is expected to be well received by the operators themselves.

Another cleaning operation facilitated by the use of the combination centrifuge and filter is that of cleaning the bowl of the purifier. Field experience showed that the unit can be operated for unusually long periods without bowl cleaning or cartridge replacement.

Address inquiries to De Laval Pacific Company, 61 Beale Street, San Francisco 5.

helps marine engines last longer

Tydol Motor Oil

Marine engines get a gift of added life when Tydol Motor Oil is used in them. For, besides safe and efficient lubrication, Tydol actually prolongs the life of engine parts.

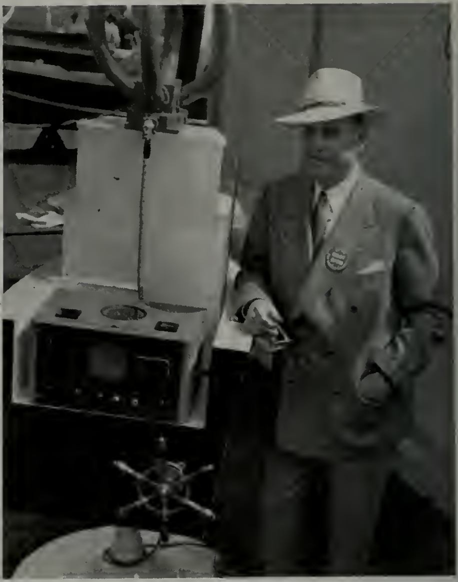
The improved Tydol Motor Oil is a balanced blend of high-quality Pennsylvania and specially treated naphthenic stocks—fortified with a unique, multi-function additive. This oil-additive combination provides *protection* against bearing corrosion, *protection* against engine wear, *stability* against oil deterioration. Moving parts get real lubrication with Tydol . . . engines run better, last longer, and maintenance costs stay down.

Next time you change oil specify improved Tydol Motor Oil. You'll note its superiority, and its economy, too.

Call your Associated Representative for expert help on any lubrication problem.

Tell Your Associated Dealer You Want a National Credit Card

TIDE WATER ASSOCIATED OIL COMPANY



The McNab Direction Finder. Claude W. Stewart, president of McNab, Inc., is standing at the right of the demonstration model of the McNab Automatic Electronic Direction Finder at the National Boat Show.

McNAB DIRECTION FINDER

A demonstration model of the McNab Automatic Electronic Direction Finder (McNab AEDF) was exhibited at the National Boat Show. The actual direction finder unit is shown mounted at the rear of the demonstration model and the automatic dial indicator is in the top of the cabinet. When McNab AEDF is tuned in on a radio beacon station or on a broadcast station, the dial instantaneously and continuously gives the bearing of the station from which signals are being received.

This direction finder is no more difficult to operate than any radio receiving outfit. The directional "loop" is fixed in position and does not have to be rotated; there is no need to first obtain a "null" indication and then determine the direction of the station. The bearings obtained can be used as a direct indicator for steering or can be easily worked out on the chart when two or more bearings are taken.

Serving a triple purpose: direct steering indication; position-locating bearings; and two-band commercial and weather signal receiver, McNab AEDF can be installed in close quarters and has an effective range of 500 miles and more. In the illustration Claude W. Stewart, president of McNab, Inc., is standing at the right of the instrument.

HOT OFF THE PRESS—

SPERRY ISSUES BROCHURE ON MARINE RADAR: A new brochure, "Important Facts To Be Considered in the Procurement of Marine Radar," is currently being distributed to the marine trade by the Sperry Gyroscope Company, Inc. It gives a factual discussion of the functions and qualifications of a radar equipment and is designed to serve as a guide to marine operators in determining essential requirements of the device (a) as an aid in piloting, (b) as a position indicator, and (c) as an anti-collision aid.

Copies of this publication (#23-216) are available upon request from the Sperry Gyroscope Company, Inc., Great Neck, New York.

B & W WIDE RANGE Y-JET STEAM Atomizing Oil Burner: A new bulletin recently issued by The

Babcock & Wilcox Company describes the construction, application and advantages of the wide range Y-Jet steam atomizing oil burner. The burner has established an excellent standard of performance in both marine and stationary plants by providing high combustion efficiency over a wide range of boiler ratings without changing the number of oil burners in operation or the sizes of the sprayer plates. Burners now installed are operating at capacities ranging up to 6000 lbs. of oil per burner per hour.

BULLETIN ON STEAM SEPARATION: Babcock & Wilcox Company's new bulletin on Steam Separation describes the equipment for steam separation in boiler drums, B & W steam scrubbers and B & W cyclone steam separators. Operation of the equipment is shown, together with illustrations of applications in several types of boiler units.

VICTOR EQUIPMENT COMPANY has published a new catalog on their large line of gas welding and flame cutting apparatus, called A Presentation of Welding & Cutting Equipment by Victor. This catalog shows four color illustrations, interestingly describes a comprehensive portion of the Victor line.

TURCO PAINT-ZIP, the title of a new 4-page, color folder describes and dramatically illustrates the remarkable ease and speed of new Turco Paint-Zip in effectively removing paint from both wood and metal surfaces without raising the grain or otherwise harming the surface. For information write to Turco Products, Inc., 6135 S. Central Ave., Los Angeles, California.

PACIFIC FAR EAST REPRESENTATION IN HONG KONG

Appointment of J. W. Harper as owners' representative in Hong Kong was announced by Pacific Far East Line, Inc. Mr. Harper became well known in West Coast shipping circles during the war as Pacific Coast administrative officer of the War Shipping Administration in San Francisco. He later was commissioned in the Navy. After the war, he joined Everett Steamship Corporation at Manila. He began his steamship career with Burchard & Fisken, Inc. of Portland and Seattle, one of the largest steamship agencies in the Pacific Northwest.

NEW LOCATION FOR GEORGE S. LACY COMPANY

The George S. Lacy Company, veteran marine products distributors, have recently moved to new offices in the Hanford Building, 25 California Street, in San Francisco. This is just across the street from where George Lacy opened his marine distributing business some 20 years ago at 16 California Street.

Among the firms represented by the Lacy firm are Boston & Lockport Block Company, East Boston, Mass.; L. W. Ferdinand & Company, Newton Lower Falls, Mass.; H. S. Getty & Company, Philadelphia; Oberdorfer Foundries, Inc., Syracuse, N. Y.; and Wilcox Crittenden & Co., Inc., of Middletown, Conn.

About a year ago the company opened sales offices in Southern California at 526 South San Pedro Street, Los Angeles, under the management of Clarence F. Herrmann.

ENLARGED RADAR IMAGE

Electronically magnified images will soon increase the value of marine radar in piloting ships and towboats through fog-bound, heavily-traveled waterways.

Developed to save hours of running time for harbor and river pilots, the new radar technique was revealed by the Sperry Gyroscope Company. It is a short range scale that spreads out the map-like picture on the radar scope to a scale larger than five inches equals one mile—large enough to make a liberty ship appear one-half inch long on the scope.

Size of the picture is more than doubled without increasing the physical size of the radar scope. The expanded picture seen on a twelve-inch diameter screen gives better definition to objects. It enables pilots to recognize clearly piers, bridge bulkheads, and close-together marker buoys.

RESTRICTIONS LIFTED ON FIBER TWINES

According to an announcement just released by Tubbs Cordage Company, pioneer cordage manufacturers of the West, government restrictions on the manufacture of hard fiber wrapping twines expired on July 15, 1947.

The Tubbs mills will immediately resume the manufacture of hard fiber wrapping twines and Pacord, the Kraft paper covered hard fiber twine.

Domestic cordage manufacturers have not been permitted to use either Manila or Agave (Sisal) fiber in the manufacture of wrapping twines since September 30, 1942.

B & W PRODUCES SOUND FILM CONCERNING MARINE BOILER CONSTRUCTION

A motion picture showing fabrication, assembly and functioning of modern marine boilers has been produced by The Babcock & Wilcox Company, manufacturers of steam generating equipment. It is designed to acquaint engineers and students with the fabrication and assembly of such boilers, and to show how the boilers operate.

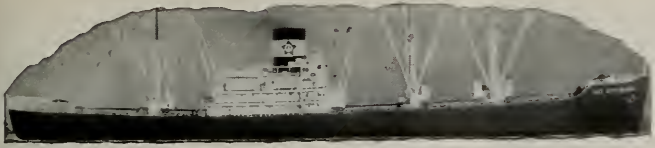
The 16 mm sound film, "Steam Power for American Sea Power," has a running time of 30 minutes. It is available to all engineering societies and colleges, and to interested companies.

After a short introduction stressing the importance of sea power and depicting the various designs of boilers manufactured by The Babcock & Wilcox Company for marine service, the scene shifts to Barberton, Ohio, where important steps in the fabrication of marine boilers are shown. The sequence begins as a flat steel plate is machined and formed to shape. The camera shows machining of welding grooves, welding of drum seams and pressing of the drum head. It follows the drum as it is X-rayed, stress relieved and the tube holes drilled.

The film also shows high lights in the manufacture of other boiler parts, such as tube bending, the application of studs to tubes, sprayer plate fabrication and oil burner assembly.

The next sequence takes place at one of the large eastern shipyards where, step by step, complete assembly is shown. When assembled, the boiler is transported to the ship. Operation of the boiler is explained through the medium of animation. A sequence on the operation of cyclone steam separators is included.

Inquiries concerning this 16 mm sound film should be addressed to: Marine Department, The Babcock & Wilcox Company, 85 Liberty Street, New York 6, N. Y.



THE SHIP'S GALLEY

(Continued from page 53)

place in the cook room where the grates are set up and in which they make fires for boyling or roasting the victuals."

During these centuries the fireplace cooking ashore had grown mightily in complexity and efficiency. In many hostelries and large homes there might be found great ranges built into the huge chimneys with intricate devices for taking care of broiling and roasting meats and poultry, boiling and steaming vegetables, and baking all sorts of pastries and confections. As ships grew in size and the length of voyages increased, much of these improvements in cooking apparatus and utensils were introduced on board. This was notably true on the British and the Dutch East Indiamen. Here cattle and poultry were carried on board to provide fresh milk and eggs. Dried fruits and sugar, spiced meats, and many other eastern dishes were staples of the menu. The preservation of fresh foods became a vital matter and much study was given to this subject.

The cooking stove or range as a separate entity divorced from the fireplace idea began to appear in America about 1800 and came into general use ashore about 1830. These were built for wood, soft coal, or antracite and at first had many troubles getting an even heating of the ovens. As these stoves became more perfect they were introduced on ships, and galleys grew to be modern kitchens.

There are still about a dozen firms in the United States who build coal or oil burning galley ranges. The chief difference between a cook stove built for marine and one built for general use is the provision made in the former to prevent pots and pans used on its top from being thrown off by the heaving and pitching of the vessel. For the same reason all dampers and draft regulators have to be made with more dependable means of adjustment and closure when the stove is intended for marine use.

Some of the firms making such stoves have specialized in marine types for over 100 years and they all make reliable products.

On the Pacific Coast the galley ranges and other cooking apparatus are now all fired either with oil or with electricity and we will in future installments, confine our treatment to marine kitchens of these two types. However, before leaving coal we want to mention a marine coal stove which was brought out some years back by a famous Swedish physicist for use on his own yacht and afterwards manufactured by a Swedish concern. This stove was very high in first cost but very economical, very efficient and tended to a very cool kitchen in comparison with the standard types. A number of installations were made in this country shortly before World War II and the stove will probably re-enter this

(Continued on page 96)

THE SHIP'S GALLEY

(Continued from page 95)

market when, if ever, normal trade relations are established.

In this scientifically designed coal-fired cook stove no live fire comes in contact with the outside sheathing of the stove. All fire is in a completely (except for well dampened flue) insulated firepot from which especially designed cast iron members carry the heat from the live burning coal to the stove top and to the oven. These heat conducting members are all insulated. A yacht owner who had then been using such a stove for approximately a year told the writer that: it used about 1/10 the coal formerly used in a standard type stove; it was as quick in cooking as a gas stove; it was far more clean and more cool in galley temperature than the standard type coal stove; and it was a far safer method of coal fired cooking so far as fire risk was concerned. This is the most radical improvement in the coal burning cook stove that has been introduced since the original invention of that apparatus.

Of course all of these relative advantages apply in the case of oil burning as compared with coal, and they are even more marked in the case of electric heating, particulary on those vessels which are equipped with a comparatively large electrical generating plant for auxiliary machinery purposes.

(To be continued)

TURBINE-ELECTRIC PROPULSION EQUIPMENT

(Continued from page 48)

cal applications include such items as boat hoists, anchor windlasses and capstans.

3. A compromise type is also made which has both a high and low resistance squirrel cage winding. Motors of this type have a high starting torque and a low slip at running speed. Typical applications include such items as compressors and geared reciprocating pumps, which start against load then operate continuously.

Fig. 1 shows the torque speed characteristics of the motors described above.

Fig. 2 shows the effect of reduced line voltage on the torque values of an induction motor with low resistance squirrel cage winding.

Characteristics of a Synchronous Motor

A synchronous motor has somewhat different characteristics than an induction motor. Pole pieces, much the same as one finds in a direct-current motor or generator, are placed on the rotor. These poles are magnetized by a source of direct current and the windings reversed on every other pole so as to create alternate positive and negative poles.

The rotating field in the stator may be likened to the waves in a sea, the tops of the wave crests being positive, and the hollows negative. The speed at which these waves travel around the stator core depends upon the speed of the generator, its number of poles and the number of poles on the motor. The speed reduction between the generator, and the motor is simply the ratio of the number of poles on each. That is, a 60 pole motor and a 2 pole generator gives a speed ratio of 30 to 1.

The poles on the motor rotor are spaced so that they are affected by the rotating magnetic field in the stator—one pole opposite the crest of each wave, and one pole opposite the hollow of each wave.

The magnetic attraction of poles of opposite polarity causes the rotor to turn in synchronism with the rotating field in the stator.

The strength of the invisible magnetic bonds that tie the magnetic fields on the rotor to their mates of opposite polarity in the stator can be increased or decreased to suit any torque requirement desired within the limits for which the motor is designed.

The strength of the rotating magnetic field in the stator is determined by the line voltage and controlled by the field excitation on the generator.

The strength of the field magnets on the rotor is likewise controlled by its excitation current.

Unity power factor (minimum stator current) in a synchronous motor is obtained by keeping the rotating fields in the stator, and the poles on the rotor of a specific magnetic strength.

If the generator field is overexcited with respect to the motor field, the system operates at lagging power factor, and if the motor rotor field is overexcited with respect to the magnetic fields in the stator, leading power factor results.

In ship applications, the two excitation circuits are arranged with resistors to balance the generator and motor fields to obtain unity power factor. When the field currents are taken from a variable voltage bus, these resistors may be fixed. When the field currents are taken from a constant voltage bus, it is customary to provide manually-operated rheostats in each field to permit adjusting each field, both for changes in load and to adjust power factor.

Fig. 3 shows the characteristics of a synchronous motor in pictorial form.

To obtain a specified starting torque, it is necessary to place a squirrel cage winding somewhat like that of an induction motor on the pole faces of the rotor. To properly synchronize a synchronous motor, that is to lock poles of opposite polarity in the stator and rotor magnetically, the squirrel cage winding should be of the low resistance type (small slip) so that the mating poles on the stator and rotor are not too far out of phase.

In starting a propulsion motor from rest, a low resistance squirrel cage winding has sufficient starting torque because the propeller is a centrifugal device in which the torque is low at start and builds up as the square of the speed. After the rotor has attained its slip speed as an induction motor, excitation is applied to the rotor pole pieces which quickly brings the rotor speed into synchronism with the revolving magnetic fields in the stator. After the rotor has become synchronized, the starting winding becomes inactive as it then ceases to cut magnetic lines of force. It does, however, serve as an

(Please turn to page 98)

PRESENT DAY PROBLEMS IN STEAMSHIP BUSINESS

(Continued from page 64)

Safety of Life at Sea acts, Reciprocal Trade Agreements, and other International arrangements.

Vessel Types

From our standpoint, the full scantling type C-2 vessel is the most suitable for general cargo. This is a vessel that can carry roughly 8500 tons deadweight, or over 13,000 cubic tons, of cargo. We have purchased five of this type of vessel.

As for completely refrigerated vessels, this type could not be used in the Pacific were it not for the many types of Government supplies requiring such space. Once this demand subsides, it is questionable just how profitably these reefers could operate. This is particularly true since the markets in the Orient could easily be flooded with perishables and a system of regularly scheduled small cargoes seems to be required

Were it not for our operating the present reefers, undoubtedly it would be necessary to install 1000 to 1500 tons of refrigerated space on our general cargo vessels. The best type of service calls for a vessel that can carry general cargo and likewise take care of 1000 to 1500 tons of perishables.

There is a question as to what additional perishable cargo the people in the Far East will later require. If these requirements go up, the statement on the full reefer vessel might be changed.

The entire Far East is in a state of development. In a year or so the picture will be clearer.

SEAGOING TUG MAMO

The famed seagoing tug Mamo was a visitor to San Francisco recently. She brought in the Stephen Austin for a repair job at Moore Dry Dock Company in Oakland. The Mamo is familiar to PMR readers because of previously featured tows from the mainland to the Islands for the Young Bros. of Honolulu. Built by Bethlehem, the Mamo has a Fairbanks-Morse power plant.

Turbine-Electric Propulsion Equipment

(Continued from page 96)

amortisseur or dampening winding, thereby preventing oscillations during periods of running.

From the foregoing description of the characteristics of a synchronous motor with a squirrel cage starting winding, it is obvious that the field lever which applies excitation to the generator and motor fields should have several positions.

First, an "OFF" position, which will allow the turbine-generator to rotate without generation of voltage. This permits the turbine to be properly warmed up before assuming a load, and also the switching of the main line contactors for "ahead" and "astern" operation as desired.

Second, a position which applies field excitation to the generator only thereby allowing the motor to come up to speed on its squirrel cage starting winding. During this period high excitation is applied to the generator field in order to attain a favorable torque characteristic on the motor. Referring to Fig 2, it will be noted how the torque characteristic of a squirrel cage motor is affected by line voltage.

Third, a position for applying excitation to the motor-rotor fields after the rotor has been brought up to its slip speed as an induction motor. This is known as the synchronizing position.

Fourth, a position that restores normal excitation on the generator.

From an operator's point of view there is only one thing to watch in operating the field lever, and that is to pause long enough on position "Two" to allow the motor to attain its slip speed as an induction motor, before moving to position "Three". There are a number of things which indicate to the operator that the proper time his been reached; these are, (1) the ammeter in the power circuit; (2) the revolution indicator, and (3) the ammeter in the motor field circuit. Although there is no excitation on the motor field poles at the time, such poles are being cut by magnetic lines of force, which causes the needle to oscillate with the slip frequency. When this slip frequency becomes low and at a constant rate the lever may be moved to the synchronizing position. Some operators prefer one indication while others prefer another.

Fig. 4 shows the principle of the squirrel cage starting winding in pictorial form.

The Hold-in Torque of a Synchronous Motor

The hold-in torque of a synchronous propelling motor can be adjusted for any value desired within the limits of its mechanical and electrical design. As previously pointed out, the hold-in torque in such a motor is simply a function of the line voltage and rotor field pole strength.

During normal operation of a ship at a given speed, there are many factors which tend to alter the propeller torque. These are: rudder movement, wind, sea, draft, trim, depth of water, and cleanliness of hull.

Any deviation in propeller torque from a given norm is immediately reflected in the line current as torque and current are proportional. This in turn causes the line voltage to dip during heavy current demands, and rise when the load falls off.

All alternating-current systems require a means for adjusting the field strength of the generator, if constant voltage is to be maintained. When the entire output of the generator is expended in a single propelling motor of the synchronous type, then the field strength of both the generator and motor may be adjusted up or down simultaneously, if unity power factor is to be maintained.

In addition to the normal adjustment for normal load and speed change, it is desirable to have an automatic means of increasing the system field strength, and hence the hold-in torque, to meet the transient torque peaks encountered from sea conditions. This appears in the form of a voltage regulator which is arranged to respond to low line voltage and operate to increase the generator field current.

As it is not necessary to maintain full voltage for reduced speed and power conditions, the voltage regulator can be designed to respond to a voltage signal approximately proportional to frequency, thereby taking advantage of reduced excitation power and less heating in the field windings. Figure 5 illustrates the relationship of frequency and voltage and normal propeller torque and current which makes this possible.

The second half of Mr. Ogilvie's paper and prepared discussion from the floor will be published in the September Pacific Marine Review.

Marine Insurance

(Continued from page 68)

must arise in the case of certain shipments. Apparently, however, the new law is to proceed without regard to any of the difficulties against which the experts warned.

To sum up, it is felt here that it remains to be seen whether this intensly nationalistic law, which virtually excludes any foreign insurers from direct participation in Argentine business, can be administered. In certain contingencies, grave difficulties must arise.

It is considered by London marine insurance people that it is very doubtful whether nationalistic insurance laws of the type of that recently adopted in Argentina are practicable, and it is recalled that, many years ago, when Mr. Behar was State Superintendent of Insurance in New York, he said, on a public occasion, that nothing could prevent an assured from placing his insurances where and with whom he pleased—he was speaking in particular of the American State laws, which then virtually prohibited the placing of insurances by United States citizens with any but "admitted" insurers.

Marine Surcharges

It is the general view that it is too early yet to form any sound opinion on the situation which has arisen following the introduction, recently, of what is described as a revolutionary new schedule of Combined Marine surcharges. One tentative view which has been expressed is that, in the face of the undoubted unrest that existed in the market over the old quadruple surcharges, and their multitude of general rulings, something had to be

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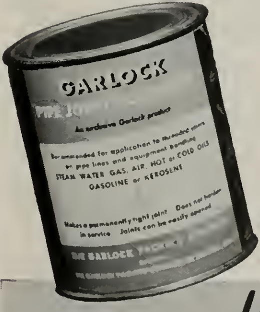

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Marine Insurance

(Continued from page 98)

done or there would have been a grave peril that a part of the market would have broken away from the surcharge system altogether, and that would have created chaos.

73 Years At Lloyd's

Seventy-three years at Lloyd's in a life—so far—of 90 years. That is the fine record of H. McClintock Harris, who has just received a telegram of congratulation on his 90th birthday from Sir Philip D'Ambrumenil, the chairman of Lloyd's. Mr. Harris, in his long career, has seen the change-over from sail to steam, the bad days of the 'eighties when Lloyd's wa salmost deserted, so little business was there to be done, the revival of the 'nineties, and the creation of the non-marine market, culminating in the Lloyd's Act of 1911. Today, Mr. Harris still takes an active part in the business as secretary to Messrs. P. B. Ingham, Limited, underwriting agents.

Admiralty Decisions

(Continued from page 68)

where they could be properly dealt with. On arrival in Portland, however, he concluded he could not submit to insubordination any longer, and, having communicated with the consul and received his permission and direction to discharge the eight men in question, tendered them their wages and ordered them out of the ship. The men refused to leave, and, again under the instruction of the Greek consul in New York, policemen were summoned and the eight men referred to were forcibly removed from the ship. Their wages to the time of discharge, which had been tendered them, were refused and subsequently turned over to the Greek consul for their benefit by the captain. This libel followed.

The facts which I have related follow rather closely the testimony that was offered by the captain of the *Niki* who testified in person. The court accepted his statement as true. His background was such that after having served as captain in the Greek Royal Navy following graduation from their Naval Academy in 1915 and later from the War College in addition to holding important naval commands and executive positions, the court would be inclined to give particular credence to his testimony. The court expressed the thought that the captain was in a rather difficult position, particularly in view of the fact that he was in a foreign country with a mutinous group in his crew. He apparently acted with commendable restraint. The court held that the master of the ship being responsible for the safety of the vessel and crew was fully justified in acting as he did under authority and instructions of the Greek Consul, who, in turn, was within his rights and fully justified in discharging the men in question and that therefore they had no cause of complaint based upon wrongful discharge. It can hardly be questioned that under general and long established maritime law the master of a ship has the right to discharge a rebellious crew. The court, by the way, also examined Greek law on the subject and indicated its inability to find any rule contrary to it.

The seamen's claims for double wages for the period following removal from the ship and up to the date of the libel were denied because under the appropriate United States Code section the penalty feature is only relied upon where the employer refuses to pay wages due a seaman. The only refusal exhibited here was that of the men in failing to take their money.

Another interesting point raised by the libelants was through an additional cause of action in which they sought recovery of sums of money deducted at various times previous to their discharge and subsequently deposited to the credit of each individual seaman in the Midland Bank of England. The court disposed of the claim by referring to the collective bargaining agreement which specifically provided for the withholding of certain portions of each seaman's wages in the manner indicated. The money could not be withdrawn until an armistice had been signed between Great Britain and Germany or the liberation of Greece. The court correctly held that it would be unjust to ask the shipowners to pay this sum again simply because it was not made immediately available to the respective seamen.

The Skipper

(Continued from page 72)

while the velocity will gradually increase for about three hours and then decrease for the same length of time, the speed is fairly constant. Being tidal in origin, these currents lend themselves to fairly accurate predictions. In places where the velocity of a rotary current is high, current rises are provided on charts.

NON-PERIODIC (NON-TIDAL) CURRENTS

Non-Periodic currents are the currents in the oceans not caused by the action of the tides, but caused by the winds. The wind sets in motion, by its friction, the water it passes over, and this is the principal cause of our open ocean currents. Another minor cause is due to the different densities of the ocean waters, the current flowing from the less dense to the more dense. This difference in density is due to the temperature of the water, warm water being less dense than cold water; or it may be due to the difference in saline content because of evaporation or freezing. Yet the currents created by the different densities of the waters are for all practical purposes negligible, and we may divide the non-periodic currents of the oceans into two groups, those caused by incidental or occasional winds, called simply wind-driven currents, and those caused by the permanent winds of the world and called permanent currents.

(A) WIND-DRIVEN CURRENTS

The navigator may calculate the velocity of the wind-driven current in a very simple manner. The wind, continuing from the same direction, gives rise to a current the velocity of which increases as the velocity of the wind increases. The drift of the current is about 2 per cent in knots of the wind velocity in miles per hour. Therefore multiplying the velocity of the wind by 2 and pointing off two places will give us the current drift. For example, with a 25 mile per hour wind. . .

$25 \times 2 = 50$ . . equals .5 knot current.

(Please turn to page 102)

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(Continued from page 100)

The rotation of the earth, however, causes a deviation in the set of the current from the direction of the wind. In general it may be said that the following rules apply:

(a) The set of the wind driven currents in the open ocean areas is about 40 degrees to the right of the wind direction in the Northern Hemisphere, and about 40 degrees to the left in the Southern Hemisphere.

(b) The set of the wind-driven currents in coastal areas is about 20 degrees to the right of the wind direction in the Northern Hemisphere, and about 20 degrees to the left in the Southern Hemisphere. This is because the deflection in coastal areas is modified by the shore lines and shallower bottom characteristics.

In the open ocean areas the above rules, derived from observations and theoretical considerations, will pretty generally hold true. Near the coast, however, the rules are sometimes violated and modified because of the effects of the coast line, and it will depend upon the angle the wind makes with the coast line whether the current will set to the right or left of the wind direction. From San Francisco to Cape Flattery, for example, it is found that winds from the northeast, southeast, and northwest quadrants bring about currents that set about 20 degrees to the right of the wind direction; winds from the southwest quadrant bring about currents that set about 20 degrees to the left of the wind direction, while winds from the south and west bring about currents that set with the wind.

The above demonstrates the inadequacy of general rules with regard to currents, and it also is to be remembered that the current which a vessel experiences at any time is the resultant of the combined actions of the tidal currents, the wind-driven currents, and any other currents which may be existing at that time. There are no glib rules which will replace experience, and it is only through years of study and observation that the deck officer will be familiar with the tides and currents encountered over the trade routes of his vessel.

(B) PERMANENT CURRENTS OF THE WORLD

There are many permanent currents of the world that are worthy of the navigators study. Among these are the north and south Equatorial currents, Equatorial counter current, Kuroshiwo or Japanese current, California current, Humboldt current, Rennels current, Rossel current, Brazil current, Capehorn current, Agulhas current, Australian current, Benguela current, and the Indian current. Figure 10 offers a sketch of the major permanent currents.

While brief description of several of the more commonly encountered currents finds a place in this article.

1. *North Equatorial Current.* This current sets west, in the South Atlantic at about 20 degrees and in the Pacific at about 15 degrees. It averages about .7 of a knot, and has its origin off the Cape Verdi Islands.

2. *South Equatorial Current.* Also sets west, from about the equator to about 10 degrees south. The velocity varies from .6 to .5 knots, and has its origin off the Coast of Africa.

3. *Counter Equatorial Current.* Sets east, under the propelling force of the southwest monsoon. Of variable velocity, it averages about 300 miles wide.

4. *Labrador Current.* Sets out of Davis Straits, and flows southward along the coasts of Labrador and Newfoundland. It passes along the eastern shoulder of the Grand Banks to about 41 degrees north, where it encounters the Gulf Stream and turns eastward. This is the current that brings the ice south into the Atlantic.

5. *Kuroshiwo Current.* The Pacific North Equatorial Current veers off the Marianas and flows past the eastern shore of Formosa. It then flows northward and eastward along the coast of Asia to Japan. At about 146 East and 40 North it divides, one part going northeast and taking the name of the Kamchatka Current. The other part continues east at about 45 degrees latitude until it merges with the northeast drift currents at about the 180th meridian. This is the Kuroshiwo Current, sometimes called the Japanese Current, and because of its dark color is also sometimes called the Black Current. This current carries with it a large quantity of gulf weed.

6. *California Current.* This current is on the Pacific Coast, from about 50 North to about 23 North. It is a cold current, about 250 miles wide, with an average velocity of .8 knot. South of Monterey it swings to about 202 degrees, and at Cape San Lucas is setting about 248 degrees. It then swings and ultimately joins the North Equatorial Current.

The Current Tables

The current tables have been compiled and published by the Coast and Geodedic Survey since 1890. Since 1923 the tables have been published in two volumes, one for the Atlantic coast and one for the Pacific coast. Table one of the Pacific edition covers daily current predictions for 15 reference stations. (See Figure 11.)

The principal purpose of table two is to furnish data which will enable the navigator to determine the approximate time of slack water and strength of current at numerous stations on the Pacific coast. (See Figure 12.)

To demonstrate the use of the tables, we would proceed this way to find the time of slack water and the time and velocity of maximum ebb at Oleum, San Pablo Bay, on the afternoon of September 11, 1947. From table two (Figure 12) we obtain the following information for Oleum: reference station, San Francisco bay entrance; time difference, plus 1 hour and 55 minutes; velocity ratio, 0.7. This means that slack water and strength of current off Oleum occur about 1 hour and 55 minutes later than they do at San Francisco bay entrance, and that the velocity of strength of flood or ebb off Oleum is 0.7 times that of the corresponding velocity at San Francisco bay entrance. From table one (Figure 11) we find that on September 11 at San Francisco bay entrance we have slack water at 1102, maximum ebb at 1327 with a velocity of 2.2 knots, and slack water again at 1632. Accordingly, applying our Oleum time difference and velocity ratio, at Oleum on the afternoon of September 11 we will have slack water at 1257, maximum ebb at 1522 with a velocity of about 1.5 knots, and slack water again at 1827.

(It is hoped that the foregoing series of articles has satisfied the interests of those deck officers who requested them. During the war years many short-comings were overlooked in the immediate emergency of manning our vessels, but now it is the *competent* officer that will gain promotion and advancement in his career at sea. This little *true story* may well serve as an illustration of how

(Please turn to page 104)

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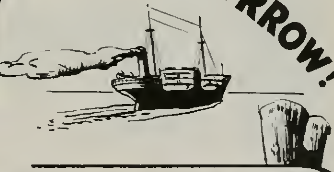

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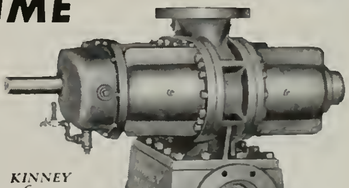

KINNEY Cargo Pump Model HQAC

Write for Bulletin 18A.

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THE SKIPPER

(Continued from page 102)

not to gain advancement; Early in 1945, having served the required time of 18 months at sea, an ordinary seaman of the Skipper's acquaintance was sitting for his Third Mate's license. The coast guard inspector was not impressed when he answered the question "name and describe three types of currents." By laboriously printing out on his examination paper "Alternating, Direct, and durned if I can think of the other one". . .)

THE CHIEF

(Continued from page 74)

this case only one) and we have the strength in pounds of this part of the joint. Dividing this by the strength of the plate in big pitch P we have a ratio which expresses the efficiency of the butt strap as to its likelihood of tearing out.

Thus the lowest value of these several efficiencies is the one to use because if the joint were to be tested in a testing machine and actually pulled apart it would fail in the manner indicated by this lowest value. The other sensitive spots would be stronger and would not break.

Note that the foregoing applies to joints with regularly and symmetrically spaced rivets. Any other spacing must be treated separately for each arrangement of spacing.

Our next article on Applied Mathematics will deal with the circumferential points of boilers and pressure drums and the interesting ratio between this and the longitudinal joint.

CLEANING OF MARINE TURBINE OIL SYSTEMS

(Continued from page 89)

was accordingly done as desired under supervision of Shell engineering representatives, and all ships are now enroute to Calcutta, from where they will sail between India and the United Kingdom. A total of 1800 gallons cleaner was necessary for the entire job, the cleaner being used repeatedly from ship to ship with makeup being added as needed. Enough used oil of satisfactory cleanliness was obtained on each ship for use as displacement oil.

Final inspection after flushing and displacement showed gears, tanks pumps, bearing housings and other visible parts to be free from all deposits. Hand wiping of tank interiors removed sediment previously loosened by cleaner. Representatives of the yard as well as of the ships' owners were very well pleased with the final results.

VARIABLE PITCH PROPELLERS

(Continued from page 45)

greater towing power or higher speed as shown by the diagram.

Steam-Turbine Vessels

Hitherto, only the combination of diesel engine and KaMeWa propeller has been considered but many of the advantages noted there apply also to the steam-turbine driven ship, and moreover, one has the following special advantages:

The turbine for going astern can be omitted whereby the efficiency is increased two per cent to three per cent. When going astern, the whole power of the engine can be used.

As the turbine always rotates in the one direction, the inevitable retardation and acceleration of the rotating masses involved in reversing are avoided, wherefore the ship maneuvers quicker.

Since the steam always travels in the same direction through the turbine, no quick changes of temperature are set up in the turbine casing, not even though one adjusts the propeller from full ahead to full astern within a few seconds. Therefore, as in a stationary turbine, one can use steam at higher pressures and superheat. Increases of 100° C. and 150° C. raise the efficiency five per cent and eight per cent respectively.

No announcement of any interest in the patents by American manufacturers but it is understood that there has been some inquiry.

NEXT CADET TEST NOV. 3,

Applications are now being received for the next semi-annual examination for appointment as Cadet-Midshipmen in the United States Merchant Marine Cadet Corps, which is scheduled to be held on November 3, 1947.

Candidates who qualify for entrance to the United States Merchant Marine Academy at Kings Point, New York, receive a four-year course combining technical training for careers as ships' officers and a college education. Graduates of the Academy are fully qualified for careers leading to the highest positions aboard merchant ships and, after experience at sea, to important shore position in the shipping industry and allied activities.

The four-year course consists of three years at the Academy and one year at sea aboard merchant or training ships. The courses at the Academy are all on a college level and include both professional and academic subjects. The year at sea affords the Cadet-Midshipman an opportunity to learn at first hand about the ships in which he will later serve as an officer. While in training, Cadet-Midshipmen receive food, quarters, and pay of at least $65.00 per month.

A graduate of the United States Merchant Marine Academy is qualified for a license as Deck or Engineer Officer in the United States Merchant Marine and commission as Ensign, United States Maritime Service; and Ensign, United States Naval Reserve. A recent act of Congress authorizes the Academy, upon accreditation by the Association of American Universities, to award Bachelor of Science degrees to its graduates.

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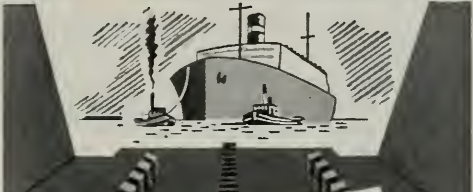

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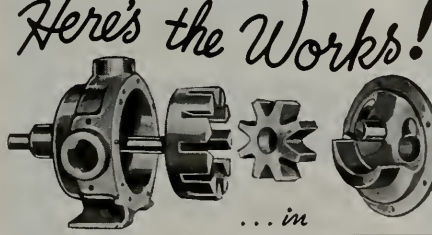


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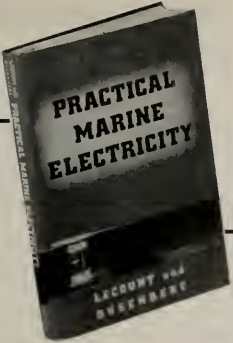
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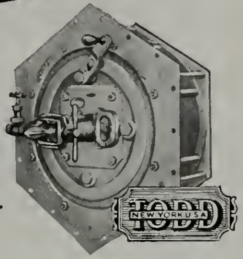

URUGUAY DRYDOCKED FOR BOTTOM REPAIRS

The 20,183-ton 574-foot *Uruguay*, one of Moore McCormack's trio of crack passenger liners on the South American run, was drydocked on June 23, at Todd Shipyards Corporation Brooklyn Division for an extensive bottom-repair job which is scheduled to take 26 consecutive working days. Todd's No. 1 Graving dock, in which it lies, is largest privately-owned drydock in New York Harbor, and the only one which can handle a vessel of this size.

This is the second step in the large-scale reconversion of the *Uruguay*, the first of the three sister ships to be released from wartime service which saw them each carrying hundreds of thousands of troops. The reconversion to passenger-carrying status began at Todd's Brooklyn yard last July when she was drydocked for preliminary work.

Now her bottom is to be scaled and painted after at least 12 plates are renewed, while numerous others will be faired in place and strengthened. Two new sea chests will be installed, a damaged wheel on the starboard propeller will be repaired, and both port and starboard tailshafts will be drawn out and inspected for possible splits. A spare tailshaft is in readiness should the inspection reveal the need for replacement.

EVERETT PACIFIC RECONVERTS SEA SCORPION

(Continued from page 51)

chinery room and #4 Hold. Reefer area in way of H Strake and upper edge of G.

Those areas involving lesser damage were faired in place. These included common seams of H and J strake in way of frames 132 to 134, inclusive and 141 to 143 inclusive; the upper edge of G strake and lower edge of J strake in way of frames 128 and 129; and the entire area between removed sections 3 and 4 mentioned above. All interference encountered, including reefer spaces and piping and electrical installations, was removed and replaced in its original state and the starboard settling tank was headed up and proved tight. No difficulties were encountered in handling the huge sections which, upon their return from shop, were secured and welded in place.

In addition to correction of hull damage described above, the work being accomplished by Everett Pacific includes general overhaul and repair of valves, pumps, boilers, turbines, deck machinery, compressors, tanks and cargo holds. Among the major reconversion items is the preparation of luxury travel accommodations for eight to twelve passengers. This work involves the complete stripping of all furnishings and equipment from four rooms; relocation of doors, air ducts, port holes, fans and lights; and refurnishing complete. All staterooms will be furnished with new best quality berths and sofas complete with coil springs and inner spring mattresses, dressing tables with abjustable mirrors, side lights and adjacent convenience outlets, upholstered dressing table benches, upholstered club type arm chairs, writing tables, drapes and carpets. In addition, officers' and crew's quarters are being extensively renovated and in some cases relocated, a new ship's hospital is being provided on the port side of the cabin deck and the refrigerated storage space is to be enlarged.

The ship's galley is undergoing a complete face lifting. Upon completion of the work by Everett Pacific, the entire area will glisten with stainless steel tops on all tables, sideboards and cabinets and a complete complement of stainless steel pots and pans.

Another major conversion item provides for fitting of deep tanks to meet all requirements to carry cargoes of bulk oils, edible oils, fuel oil or dry cargo. In addition to the installation of miscellaneous fittings, the tanks will be thoroughly cleaned to the satisfaction of the American Bureau of Shipping and the Saybolt Inspector for edible oil.

All of the work is being accomplished for the Maritime Commission to restore the vessel to her "in class" status according to the standards of the American Bureau of Shipping and the Coast Guard before delivery to her new owners, Pacific Transport Lines, Inc. of San Francisco. The *Sea Scorpion* is one of three C-3 type freighters acquired by the Pacific Transport Lines at a total cost of $5 million. She will be renamed the *Pacific Transport* as the flagship of the line, operating in their regular service between California ports, Japan, China and the Philippine Islands.

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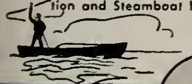

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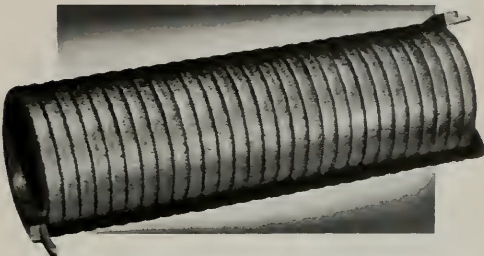

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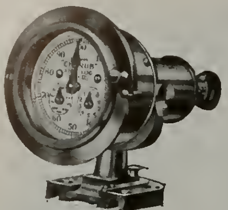

THE RUTHIE B

(Continued from page 70)

bulkheads and a transom bulkhead, extending to the main deck, a cofferdam for chain stowage, a forward fuel oil deep tank, a machinery space, and eight brine wells arranged in two rows of four each.

Propeller is 72" by 56", built by Doran Co., and designed especially for the *Ruthie B.* by William Lambie.

The ship has a book keel under the hull, and shell plating is 5/16" steel. Floors are constructed of 5/16" steel plate in the engine room and wherever floors are oil tight. Other floors are ¼" plate. A 5/16" center vertical keep is provided.

CORROSION AND OXIDATION

(Continued from page 55)

of steam corrosion we have experienced, it is significant to note the following similar characteristics:

1. The iron oxide produced by corrosion of both steam and flue gas was tightly adherent to the unaffected metal.
2. The oxide was cracked both longitudinally and circumferentially and consisted of several layers.
3. The failures were stress failures brought about by weakening due to oxidation.
4. The tubes were subjected to considerable rapid cooling at intervals by steam or steam and water from deslagging operations.

In addition to the examination of tubes that have failed, we have examined tubes that have been in service for extended periods of time at temperatures of 1100° to 1150° F (590° to 620° C) but which have been removed for inspection or reasons other than failure. In all cases a very thin layer of oxide is found on the steam side of the tube, always tightly adherent but not cracked. The thickness is estimated to be 0.002 to 0.004 in. (50 to 100 microns). There is also an external oxide layer which is usually so contaminated with fly ash or slag that an estimate of the thickness is impractical.

Microscope Studies

Figures 21 through 24 are photomicrographs of a five per cent Cr. 0.5 per cent molybdenum tube that was in service in a superheater for about 10,000 hours and was removed for inspection. No distress or failure occurred. Maximum metal temperatures during this period were about 1080° F (580° C) on the gas side, and 1060° F (570° C) on the steam side. Maximum steam temperature from the tube was about 980° F (528° C). (See Captions.)

Figures 25 through 30 show a photograph and photomicrographs of a tube that failed in a manner as described in the first case discussed. This failure was directly opposite the deslagger.

Figure 25 shows the general appearance of the failure. Note the swelling in zone of failure, and the blunt edges of the fracture. This indicates a creep type of failure.

Figures 31 to 34 show photomicrographs of another tube that failed in a similar manner. Figures 31 and 32, at 1000 diameters and 100 diameters respectively, shows the outside and inside surface near the fracture, and Fig. 33 shows the edge of the fracture at 100 diameters. Intergranular penetration is seen to be about the same for both inside and outside surfaces. Figure 34 is a photomicrograph at 1000 diameters, etched, to show the outside surface ¼ inch (6 mm.) from the fracture. The intergranular oxidation is apparent. The carbides have coalesced and segregated along the grain boundaries. This indicates that temperatures in the order of 1300° to 1350° F (700° to 730° C) were reached before the fracture occurred.

Steps in the Corrosion Process

1. A thin, tightly adherent, oxide deposit forms on both the steam side and gas side of the tube wall.
2. The temperature shock of the relatively low temperature steam or steam and water from the deslaggers causes cracking of the oxide due to the different thermal expansion characteristics of the oxide and the metal.
3. The surface exposed at the base of the cracks becomes oxidized.
4. This cycle is repeated many times.
5. The layer of oxide on the inside metal surface raises the metal temperature in the tube, thus increasing the oxidation rate.
6. Progressive oxidation from both the inside and outside of the tube wall reduces the thickness of the wall, and increases the stress.
7. The increased temperature reduces the strength of the metal, which together with the increased stress (step 6) causes accelerated creep of the metal.
8. The accelerated creep continues until failure occurs.

Conclusion

In conclusion, our experience has shown that the alloys which are used in superheater tubes at high temperatures are satisfactory when properly selected for the expected temperature. We do not anticipate anything more than "growing pains" in the new designs for 1050° F (565° C) steam temperatures.

Our experience with chromium-molybdenum steel alloys containing from two per cent to nine per cent chromium, and 0.5 to 1.0 per cent molybdenum has shown them to be very satisfactory for use with metal temperatures up to 1200° F (650° C). Above this temperature, it appears that stabilized 18/8 stainless alloy is satisfactory, and indications are that this material will be more extensively used in the future.

Pacific MARINE REVIEW

SEPTEMBER, 1947

MEN and ROPE

"Jerry" Favero operates the train which is used by the yard crew at the Tubbs Mills in San Francisco.

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With the Port Engineers—

Pacific World Trade By T. Douglas McMullen

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Pacific MARINE REVIEW

ARE CITIES INTERESTED IN SHIPS?

IN A RECENT ISSUE OF LIFE there is a drawing of the pay window of a shipyard in the 16th Century Venice. The yard's 16,000 men, says the caption, swelled the city's prosperity. Needless to say, the stay in port of ships' crews, the provisioning of the vessels, and ship traffic with other ports, contributed also. With little else in the way of resources, Venice continued to prosper for 400 years. When other port cities weaned away her commerce, Venice ceased to be important.

It is a startling fact that most of our port cities do very little for their shipping and shipbuilding industries. Our ship operators can be "priced" or "pay rolled" out of business when a concerted public opinion, sparked by a properly interested city government, civic group or daily press, could avert it. We rise in wrath or fear if public health or physical safety is threatened, and even when certain forms of amusement are in danger, but no one outside of the industry gives it a thought. Perhaps it is not realized that so many are affected.

Does a city official (or let us say, a *candidate* for office) know that there are 9800 families in San Francisco whose incomes come entirely from shipbuilding? The occupational distribution in a shipyard is as follows:

Managerial	150	Skilled	4300
Technical	750	Semi-Skilled	1900
Clerical	1350	Unskilled	750
Supervisory	600		

Those classed as skilled include backsmiths, boilermakers. The semi-skilled and unskilled are the apprentices, helpers, expediters, buffers, oilers, rivet heaters, storekeepers, truck drivers, firemen, guards, laborers and handymen. And there are the insurance people, the transportation facilities, the public utilities serving the yards. Altogether they represent a good cross-section of the city's population, and they buy at all types of stores, patronize the theater and support the churches. And they vote. And so do those whom they support.

Shipbuilding, however, is only one phase of the shipping industry. The yards buy materials from other manufacturers. A report just released by the John Brown shipyard in Scotland on the conversion of the Queen Mary refers to the 4000 miles of electric wiring and the 12,000 light fittings that were replaced. Also the tons of paint and the six miles of carpet and the 500,000 pieces of linen. Much of such equipment needs frequent replacement. Altogether this job required 15,000 man-months of work.

And the ship operations. Office buildings, taxes, personnel, crews, longshoremen, shippers, insurance (of which some 30 odd millions of dollars circulated through San Francisco last year), and the hundreds of millions of dollars' worth of American products that were shipped.

Does no one in officialdom care about this great part of his city's prosperity? Yet a major stoppage of shipping or shipbuilding can occur without a voice outside the industry being raised.

Wake up, gentlemen! Do not leave it to the heroic efforts of a few business men to overcome the obstacles being placed in their way by those with selfish interests to serve.

American Mail Line's Oregon Mail, prior to recent San Francisco departure.

The AMERICAN MAIL Line

By WALLACE V. MACKAY

FORERUNNER OF THE AMERICAN MAIL LINE of today was the organization, way back in 1850, of the Pacific Coast Steamship Co., with the side-wheeler *Goliath*, which operated between San Francisco and San Diego. A complete reorganization, effective February 9, 1940, led to the acquirement of a substantial interest in the company by Richard C. Reynolds of Florida, and to the acceptance by the Maritime Commission of an agreement for the charter of six ships, then operated by the Pacific Northwest-Oriental Line, the assignment of the Orient route to the company, and plans for the purchase of new ships.

The war intervened, but the program was promptly resumed and six C-3's and three C-2's have been acquired.

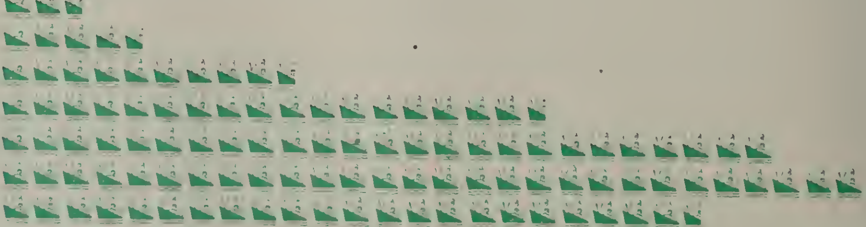
The Ships

The C-3's are:
American Mail, ex Sea Adder.
Washington Mail, ex Sea Tarpon.
Oregon Mail ex Sea Satyr.
Canada Mail ex Sea Hare ex Goshen.
India Mail ex Sea Arrow ex Alpine
Java Mail ex Grafton.
The C-2's are:
Island Mail.
China Mail ex Japan Mail.
Ocean Mail ex Empire Peregrine ex China Mail.

Conversion to American Mail requirements was performed in the yards of Puget Sound Bridge and Dregging Co., Seattle; Bethlehem Steel Company, San Francisco yard; Todd Shipyards, New York; and Tampa Shipbuilding Corp., Tampa.

Thus has ended successfully a long fight for assured operation of an Oriental route with control centered on Puget Sound and the Pacific Northwest rather than elsewhere on the Pacific Coast.

The American Mail, Washington Mail and Oregon Mail are C-3-SA2's and were built at the Ingalls Shipyard at Pascagoula in 1945. They have General Electric turbines and Foster-Wheeler D type boilers. Gross tonnage of this type is 7943 and net 4672. Length is 492 feet, breadth is 69′ 6″, and depth 29′ 6″. Other particulars indicate 60.2 tons immersion to the inch; bunker capacity 10,776 barrels or 1625 tons (excluding deep tanks); fresh water capacity of 407 tons; fuel consumption while steaming 350 barrels a day and while in port 50 barrels. Cubic bale capacity is 642,590 c.f. or 712,390 c.f. grain, plus 49,395 c.f. refrigerated cargo space. Hold compartment No. 2. contains deep tanks, port and starboard, for a total of 55,840 c.f. (1594 tons) of edible or fuel oil. Each vessel has eight sets of 5 ton and two sets of 10 ton cargo gears. Also one 30 ton heavy lift gear.



History of American Mail Line, Ships—each figure represents two ships operated

The Canada Mail, India Mail and Java Mail also are C-3-SA2's and were built at Western Pipe and Steel Company's shipyard at South San Francisco in 1944. All have General Electric turbines. The Canada Mail and Java have Babcock and Wilcox boilers and the India has a Combustion Engineering boiler. These vessels retain their wartime radar equipment. Gross tonnage is 7970 and net 4605, and immersion is 60 tons to the inch. Bunker capacity is 10,672 barrels or 1593 tons and fresh water capacity is 396 tons. Fuel consumption, while steaming is 350 barrels per day, and while in port 50 barrels. Cubic bale capaciey is 733,032 c.f., or 811, 120 c.f. grain, with no refrigerated cargo space. Deep tanks are of same capacity as the three Ingalls-built ships. Each vessel has six sets of 5 ton, two sets of 10 ton, and two of 30 ton cargo gear.

Designed speed of all the above is 16½ knots.

C-2 Diesels

The China Mail, Ocean Mail and Island Mail are C-2 SU motorships, built at Sun Shipbuilding and Dry Dock Co. in 1941 and 1942. They have Sun Doxford diesel engines of 7500 hp for a designed speed of 16 knots. Gross tonnage is 6600, net 3854. Overall length is 474′ 1″, breadth 63′ and depth 40′ 6″. Immersion is 52.6 tons to the inch. Bunker capacity is 11,070 barrels or 1627 tons and fresh water capacity is 520 tons. Fuel consumption at sea is 200 barrels a day and in port 28 barrels. Cubic bale capacity is 503,665 c.f., or 559,060 c.f. grain, plus 28,150 c.f. refrigeration space. Wing tanks are available for an additional 674 tons of fuel or edible oil. The five hatches have a total of seven sets of 5 ton cargo gears.

In these feature articles on the operating companies and their ships, it is not possible to deal exhaustively with all of the equipment on every ship. What we try to do is to elaborate on some one type of ship, and discuss its construction or deck engine room fittings, or passenger accommodations, and record the changes that time and experience and trade route may dictate. Thus

At top: Washington Mail, one of six new 16-knot cargo liners of the 12,800 dw ton class among the fleet of fast ships operated by American Mail Line Ltd. in Oriental service out of West Coast ports. Each ship has limited passenger accommodations. Five are fitted for refrigerated cargo.
Center: China Mail with full cargo including deckload of lumber for Oriental ports. This vessel is of 10,200 dw ton class operated by American Mail. New service includes Dutch East Indies, Malaya, Bay of Bengal, Calcutta.
At bottom: Main house of Oregon Mail features corrugated construction. She was originally built at Ingalls and a $300,000 reconstruction job was done at Bethlehem Steel's San Francisco Yard.
At left: One of the reconverted features is replacement of Pilothouse Ports with new Kearfott K-15 Jump Sash Windows. Many ships are doing this lately for maximum visibility and noticeably brighter pilothouse interor.

A A. Lintner, president and director

G. J. Ackerman, operating manager.

E. E. Anderson, traffic manager.

Barbara E. Watson, manager at San Francisco.

Frank H. Howard, superintendent engineer, is in charge of Maintenance and Repair Division.

W. L. Williams, manager, at Portland; also a director and assistant secretary

Ralph B. Bush, treasurer, assistant secretary and company diractor.

Gilbert Hibson, traffic manager in San Francisco.

from month to month we cover many ships. In this story we will examine especially the Sun-built C-2 diesels which American Mail has acquired.

After the Sun Doxford diesels mentioned above the number 1, 2 and 3 auxiliary engines are 375 hp Cooper Bessemers, with Westinghouse generators, Weston tachometer magnetos, Fulton safety controls, and Ross water coolers. Motor generator sets (upper and lower) are Westinghouse. The main engine fresh water pumps are Worthington with Westinghouse motors, main engine lubeoil service pumps are Quinby and Westinghouse main engine fuel oil starting pump is Watson-Stillman with Westinghouse. The scavenger blower is a steam driven Roots-Connersville with Whiton turbine. Main and auxiliary air compressors are Ingersoll Rand. Main engine salt water cooling pumps are Worthington, as are the sanitary pump, ballast and bilge pumps, five pumps, and auxiliary fuel transfer pump and drinking water pumps. All have Westinghouse motors.

Upper and lower main engine fuel booster pumps are DeLaval, lubricating oil and fuel oil centrifuges are Sharples.

The American Engineering Co. furnished the anchor windlass and cargo winches; refrigerating machines are Carrier-Freon; the steering gear is Sperry as is the compass. Davis Engineering Co. furnished the Paracoil evaporator. Among major machine tools there is a Champion 20″ drill press, a LeBlond 24″ lathe and a Smith-Mills Shaper.

The Ilg Electric Ventilating Co. furnished quite an assortment of fans, including diffuser fans, cargo ventilating fans, and quarters air conditioning fans. Engine room ventilating blowers have Westinghouse motors, and the main engine turning gear has a 30 hp Westinghouse motor and controller.

Electric Galley

The main galley equipment is electric, with Hotpoint range and Hotpoint water heater, potato peeler and mixing machine are Hobart.

The Canada Mail leaves her Hoboken pier on her maiden voyage for the American Mail Line.

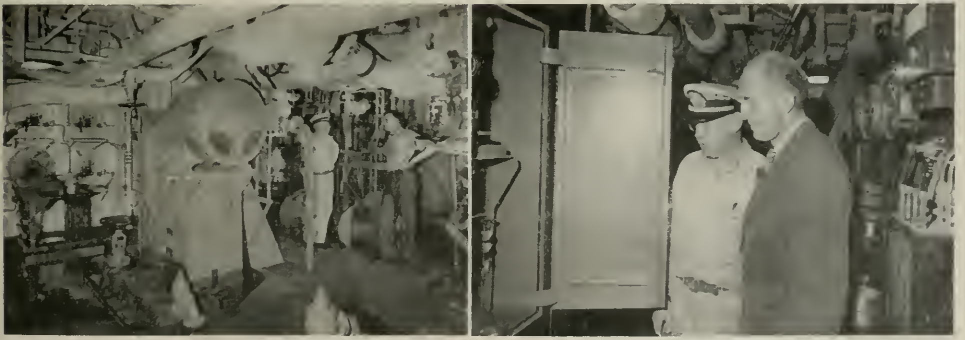
The Oregon Mail

Perhaps the most outstanding job of reconversion on any of the vessels of the American Mail fleet was that done at Bethlehem's San Francisco yard on the Sea Satyr, now the Oregon Mail. This ship had struck a mine in the South Pacific and required major hull repairs which Bethlehem completed with dispatch. But there is more to fitting out a ship than the structural part—especially when passengers are to be carried. The Oregon Mail had the benefit of the continued personal attention of the company's San Francisco Manager, Miss Barbara Watson. The engine room, too, shows the handiwork of Port Engineer Frank Smith, who sailed on the converted ship's first voyage as chief engineer.

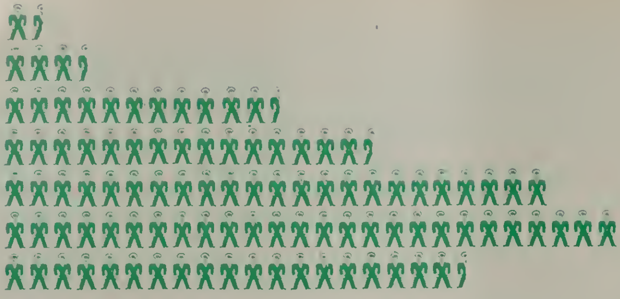
Biographical

The American Mail has a fine cross section of maritime personnel to aid in establishing its place in Pacific operations. The following are pictured on page 40:

President A. R. Lintner moved west in 1916, was associated with shipbuilding and shipping interests for many years. In March, 1940 he became General Manager of the reorganized American Mail Line. He was elected a director of American Mail in 1945, and then was elected President on January 2, 1946.



At left: J. E. Edwards, second assistant engineer at Foster-Wheeler boilers; Worthington variable stroke electric feed pump in center; Chief Engineer Frank W. Smith and first assistant engineer, Fred Cuffin, in front of Worthington automatic fresh water pumps, and behind him a bank of Davis "Paracoil" evaporators.
At right: Chief Engineer Frank Smith and Douglas Dickie of Foster-Wheeler, at new F-W general regulator for combustion control, on the Oregon Mail.



Seagoing personnel—each figure represents 100 employees.

R. B. Bush, treasurer of American Mail, in 1940 joined the American Mail Line as Comptroller, in charge of all auditing and finance. He was elected Treasurer in 1941 and was made a director of American Mail in 1946.

Gilbert J. Ackerman, manager of the company's Operating Department, joined American Mail on April 1, 1945 as operating manager, bringing with him 18 years of engineering experience.

E. E. Anderson, traffic manager, joined the company on March 1, 1946, as assistant traffic manager.

Frank H. Howard, superintendent engineer in charge of Maintenance and Repair Division joined American Mail in 1940 as Port Engineer.

W. L. Williams, a director and manager of the company's office in Portland, Oregon, joined American Mail in 1940, when the company arranged to include Columbia River and Oregon ports in its trade area. He became a company Director in May, 1945.

Miss Barbara E. Watson, manager at San Francisco for California. She joined the San Francisco office in 1943 as manager when the company needed an operational branch in San Francisco. She had the ambition plus "what it takes" in brain matter—to become an all around transportation "guy," and made it.

Gilbert T. Hibson, traffic manager at San Francisco, joined American Mail in 1947 in San Francisco where he is now stationed.

Collecting A Ship

One of the strangest assignments in the history of world commerce was made by the War Shipping Administration, to the American Mail Line, in the summer of 1944. The vessel *Valeri Chkalov,* a Liberty ship assigned to Russia under Lend-Lease, had broken in two the previous November, off an Aleutian island, while bound from Siberia to Seattle in ballast. This vessel is referred to elsewhere in this issue in the article on Welded Ship Repairs. The break had been clean, the ship parting in two as if severed with a gigantic knife. Her watertight bulkheads had held, and both her forward and after sections had remained afloat. All her officers and crew had been rescued by other vessels then in the vicinity. The *Valeri Chkalov's* bow had been towed to Kodiak Island in the Aleutians, while her after portion was brought to Vancouver, B. C. Subsequently the bow also was towed to Vancouver, and there the two sections were welded and re-made once again into a complete vessel, which has successfully operated since and is presently in service as the *SS Alexander Baranoff.*

Seattle Trade Campaign

Seattle has a cooperative campaign to sell Seattle's expanding industrial, foreign and Alaska trade potentials in capital letters in the nation and the shipping world. It was launched officially during August.

The campaign, spearheaded by the Port of Seattle, with the cooperation of the Alaska and Foreign Trade Committees of the Chamber of Commerce, leading airlines and steamship lines, and representative manufacturers of famous brands from Seattle that reach the markets of the world, will be regional, national and foreign in its scope of aggressive promotion. The American Mail Line will have an important part in this program.

Shoreside Personnel—each figure represents five employees.

REPAIRS TO WELDED SHIP HULLS

By E. C. RECHTIN, Manager, San Pedro Yard,
Bethlehem Steel Company Shipbuilding Division

E. C. RECHTIN is the manager, San Pedro Yard, Bethlehem Steel Company, Shipbuilding Division, at Terminal Island, California. He graduated from Webb Institute of Naval Architecture, and became affiliated with Bethlehem when the company purchased United Shipyards in New York in 1938. Subsequently, he was appointed assistant manager at San Pedro in charge of new construction, and in February, 1945, he became manager of the San Pedro Yard.

Mr. Rechtin has been a leader in the development of welding for marine construction. He originated and developed a serrated channel system of welded construction which has been widely adopted. He was also active in developing the principles of welding large panel pre-assemblies and the application of automatic welding. He is a member of the Society of Naval Architects and Marine Engineers, The American Welding Society and the Propeller Club.

This article is an adaptation and expansion of an address before the Society of Port Engineers, Los Angeles.

PART I

THE RECENT UNFORTUNATE BREAK-UP of the T-2 tanker *Fort Dearborn* has again drawn attention to the problem and danger of major fractures in welded ship hulls generally and in the T-2 tanker in particular. The publication of the final report of the board of investigation convened by the Secretary of the Navy to inquire into the Design and Methods of Construction of Welded Steel Merchant Vessels was, therefore, particularly timely. This work represents the efforts of a group composed of the foremost men in the marine profession and must necessarily become a basic reference. The problem has been skillfully attacked and it is felt that answers have been found to much of the trouble, but the danger still exists since those answers have not always been applied in practice. One of the conclusions which has been reached is that mere time away from the builders yard without serious failure does not confer immunity to the danger on any such vessel, witness the *Fort Dearborn*.

It is easy enough to point to the small percentage of failures out of the total number of ships built and to feel that we can write them off as a calculated wartime risk incident to the large scale application of a new process. In peacetime, however, percentage of failures is not the proper criterion for engineering design, and it is the responsibility of everyone concerned to produce vessels as structurally safe as our present engineering knowledge permits.

From an engineering point of view every effort has been made to find out the basic causes of these failures and this has been the work of the Board previously mentioned. It is believed that we have definite remedies that can be applied to existing ships and so far experience has borne out this belief.

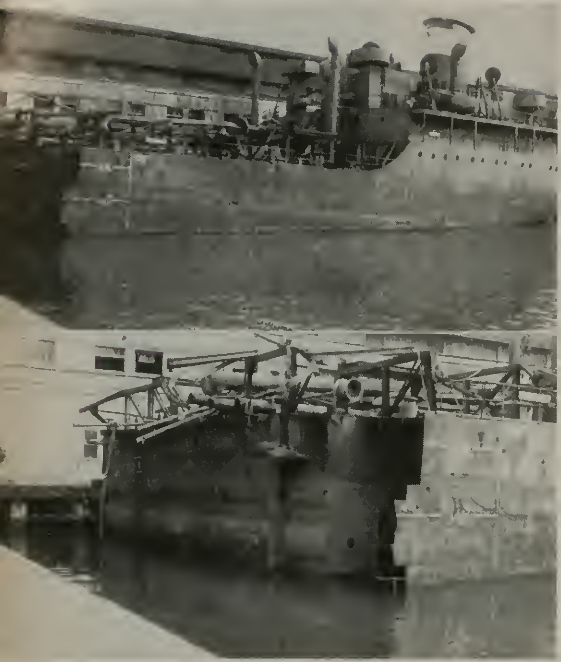
A general summary of the types of failure and their basic causes should be helpful in understanding the technique of overall preventive work and detailed repairs later suggested. Following are examples of vessels that have had failures.

The illustrations and their captions bring out the pattern of the failures. The Coast Guard report on the *Schenectady* reads thus:

"Without warning and with a report which was heard for at least a mile, the deck and sides of the vessel fractured just aft of the bridge superstructure. The fracture extended almost instantaneously to the turn of the bilge, port and starboard. The deck, side shell, longitudinal bulkheads, and bottom girders fractured. Only the bottom plating held."

The vessel is a T-2 tanker and was lying alongside the dock. A moment before the failure no one could have seen anything unusual, in a matter of seconds she was totally useless. The point to note is that the causes of failure were not apparent and there was no time to try to remedy anything and the failure was complete.

The broad-side view of the vessel indicates quite clearly the location and general nature of the fracture. It is at a point where the longitudinal strength of the



Fore and aft sections of the Fort Dearborn in Honolulu harbor (shown below, left, at sea).
Above photos courtesy of D. M. Taylor of Mackay Radio & Telegraph Co.

vessel has been seriously affected by the discontinuation of the midship structure.

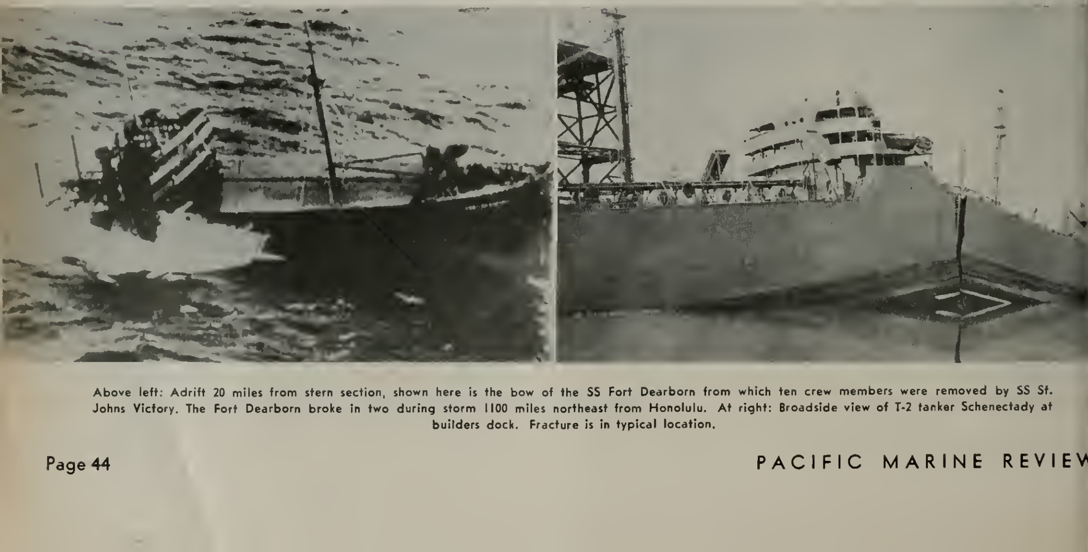
All of the longitudinal members of the deck, the longitudinal bulkhead plating, and even the pipe line fractured almost in the same plane. There does not appear to be any evidence that the fracture followed any line of welding. There is an I-beam which acts as a connecting member forming the intersection of longitudinal and transverse bulkheads. While the fracture of the *Schenectady* did not occur in this particular place, other similar tankers have shown local cracking at this point.

In the *Esso Manhattan* case which happened at sea under presumably normal conditions, the account of this failure mentions the explosive quality of the break. Here again, no one could have predicted failure from any obvious symptoms. The fracture started in a defective butt weld at the crown of the deck, considerably aft of the midship superstructure, and progressed across the deck and down the vessel's side clear of welding.

These examples point out the extreme importance of understanding what we are doing to a welded ship when we add to or alter structure in such a way as to change the strength of stress pattern or the vessel. Understanding of the effect of welding sequences and the nature of the stresses that go with welding are necessary to avoid introducing new factors which might be detrimental to the vessel's behavior.

The *John P. Gaines* was a Liberty vessel of standard design. The break on this vessel is located again directly at the break of the superstructure. The records show that a break occurred at night making a loud noise, but that the crew could not locate the trouble in the dark. About twenty minutes later, the vessel broke completely in two. Conditions were reasonably normal, although a heavy ground swell was running. The crack started near the forward corner of No. 3 hatch. A hatchway represents a break in continuity of structure just as much as the break of forecastle, house, or poop. Here again we have the condition of a stiff portion of the ship in way of the superstructure making a primary point of transition of strength with the fracture occurring at a secondary break of continuity, namely the hatch corner. This, from a structural point of view, is quite similar to the location of the T-2 tanker.

A fourth and last example, the *Valery Chkalov,* an-



Above left: Adrift 20 miles from stern section, shown here is the bow of the SS Fort Dearborn from which ten crew members were removed by SS St. Johns Victory. The Fort Dearborn broke in two during storm 1100 miles northeast from Honolulu. At right: Broadside view of T-2 tanker Schenectady at builders dock. Fracture is in typical location.

other Liberty ship, shows the same characteristics. This vessel broke up in a storm, with cracks starting in the corner of No. 3 hatch. The location of the fracture is very clearly shown, occurring just forward of the house at the No. 3 forward corner. This fracture does not show the same clean break that the others do, there being more evidence of a tearing action on the side plating. This might, of course, be due to the fact that the vessel was in a sea-way at the moment of fracture and there may have been considerable motion between the two halves of the vessel.

We could go on showing similar examples of vessels, more or less serious, but these are typical. A great deal of thought and study has been given to the causes of these failures by many well qualified people. Vast research programs have been carried out and procedures of correction have been developed which are designed to prevent failures of this type.

Everyone is agreed that the use of welding speeded up the war effort and was a contribution of inestimable value to the final victory. The spectacular failures, however, caused deep concern and for a while it was feared that they might have a serious effect upon the whole war program if it had been demonstrated that the technique of welding ships was basically unsound. The actual process of welding is generally well understood, but the cummulative effects on a large structure such as a ship were, at the outset of the war, relatively unknown. A general feeling became prevalent that all the speed of construction and the ballyhoo for records had resulted in careless and inferior workmanship and a general disregard for proper construction practices. It was felt that some shipyards were careless in observing welding sequences and that consequently locked-in stresses were being created which might be contributing to the failures. In all fairness to the over-all shipbuilding program, it should be pointed out, however, that the percentage of serious failures was not very great.

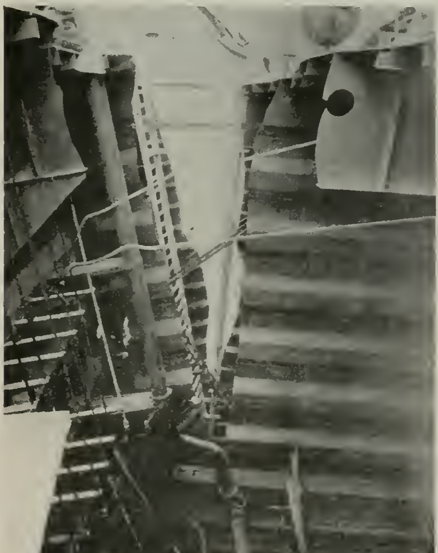
Many Failures

The Board investigated 4694 ships. About one-fifth of these sustained some failure, although only 127 could be considered serious. Twelve vessels were lost or broken in two, the failures occurring in various types of ships and were not confined to Liberty ships. Although the percentage of vessels can be considered low, failure of any kind on a vessel cannot be tolerated from an engineering standpoint and it was, therefore, extremely important that the Board arrive at some definite conclusions and recommendations for remedy.

The final conclusion reached by the Board was that the problem was primarily one of design and material. The welded ship becomes one piece and as a result certain joints, particularly at structural breaks, can be subjected to severe restraint and high stress concentrations. Every fracture started in a geometric discontinuity or at a notch resulting from poor design or workmanship.

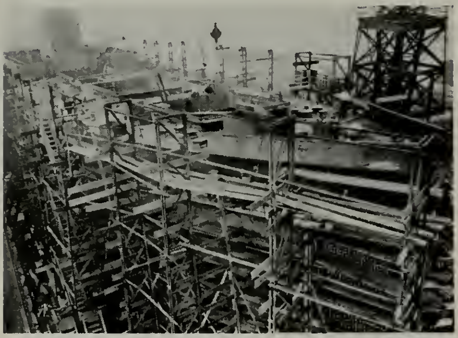
Figure 6, which is a complete diagram of a Liberty ship, shows where most of the failures occurred. This diagram does not represent any one ship, but is a combination of many. The majority of cracks were at No. 3 hatch which is near the break of the house or at the forward end of the house. These are obvious points of change in the cross-sectional area of the vessels structure. Such changes are, of course, inherent in the original design of the ship and the repairer can do very little about them. We must, however, realize that these areas are exceptionally vulnerable and dangerous and that any welding work done therein should be performed with exceptional care. The importance of proper basic design and distribution of strength is apparent. The importance of carefully detailed workmanship, however, is not so easily recognized. Poor workmanship allows cracks to start in such places as peened-over cracks, under-cut welds, porosities, or slag inclusions or by hollow welds where voids have been covered over. These defects are quite difficult to locate by superficial inspection. They are almost microscopic in size in relation to the size of the vessel. To anyone accustomed to riveted structures it seems fantastic to be asked to believe that from such apparently insignificant things major failures can result. Several rivets in a butt or seam can be faulty or missing completely and nothing happens. How then could a minute crack start a series of events resulting in the ship breaking in two?

The reasons for this phenomenon are many. Whole volumes have been written on ships' stresses and on metallurgy and the mathematical treatment of the subject becomes very complicated, but perhaps a rather



Inboard view of fracture of Schenectady showing clean break of all structural members.

Aft section of Valery Chkalov showing break in end of No. 3 hatch.



C-1-B building at Sparrows Point yard. Counting marks show extent of riveting. Similar practice was followed in later Bethlehem Libertys.

over-simplified explanation will serve to bring out the point.

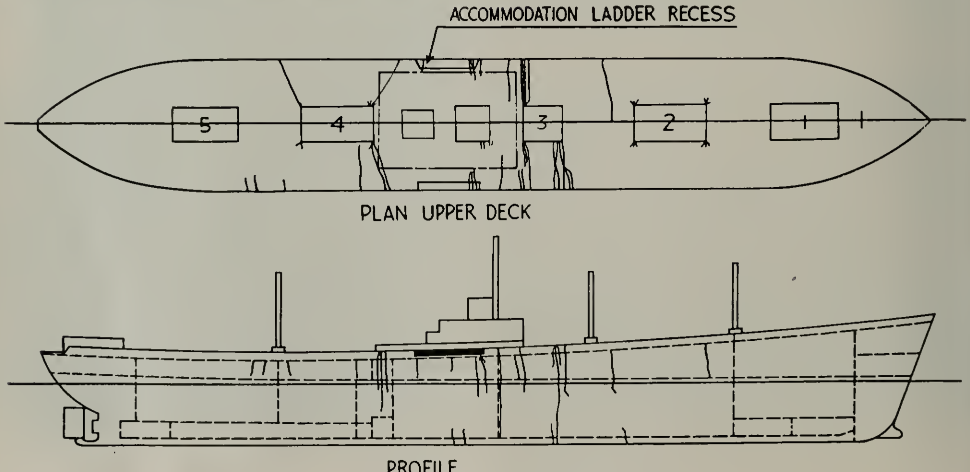
When a ship is just about to break in two we can imagine two groups of forces, one outside of the ship trying to break her, and the other inside trying to hold her together. That is something like thinking of a person subject to temptation with his conscience trying to keep him from going wrong.

The wind and the waves, the load of cargo, the motion of the vessel, and the thrust of her power plant are the "outside forces." The strength of the material, the integrity of the joints, and the soundness of the design are the "inside forces." Here again we can pursue our analogy. If a man's heredity, his physical strength, and his bringing-up are lacking, he succumbs to temptation and fails. If the ship's design, its physical strength, and the quality of its workmanship are faulty, it fails. Thus, the outside forces can and do find allies, a sort of fifth column, within the ship. The effect of the outside forces can be summed up as an effort to break the ship as one would break a stick over one's knee. This force can be called "bending moment" and attains its maximum value at the center of the ship. This value can be mathematically determined if we assume a certain standard type of wave of mathematical nature which very closely approaches actual waves at sea.

The "inside forces" depend upon the strength of the material itself and upon its disposition. The same weight of material advantageously disposed can resist a far greater load than if it were improperly placed. This, of course, is basic design practice. The mathematical expression for this group of factors is called "section modulus" and can be determined from a mathematical consideration of the structure of the vessel.

When the section modulus of a monolithic structure

(Please turn to page 106)



Composite diagram of Liberty ship fractures.

THE PRESIDENT'S ADVISORY BOARD

THE PRESIDENT'S ADVISORY COMMITTEE on the Merchant Marine, the members of the fact-finding committee appointed by President Truman to make recommendations on U. S. Maritime policy, are K. T. Keller, president of the Chrysler Corporation, chairman, Marion B. Folsom, treasurer of Eastman Kodak Co.; Andrew W. Robertson, chairman of the board of Westinghouse Electric Corporation; James B. Black, president of the Pacific Gas & Electric Co., and Vice Admiral Edward L. Cochrane, former Chief of the Navy Bureau of Ships and now Chief of the Material Division in the Office of the Assistant Secretary of the Navy. Admiral Cochrane is currently president of the Society of Naval Architects and Marine Engineers. The Committee has held a number of hearings and is expected to complete its report to the President at an early date. A review of the testimony offered on behalf of a number of elements of the industry will be outlined in this and subsequent issues.—Ed.

Shipbuilders Council of America

H. Gerrish Smith, president of the Shipbuilders Council of America, presented a historical review of the industry, together with legislative exactments and elaborate charts showing ship construction from 1914 through 1946, and concluded with:

"The most important facts demonstrated by this presentation may be briefly summarized as follows: The industry shows great fluctuation in volume of business throughout the years with a definite lack of the continuity essential to a successful and healthy business. During the past 33 years, two momentous ship construction programs were undertaken and completed incident to the World Wars. In both cases, circumstances provided several years of preparation, which enabled the industry to expand sufficiently to undertake the war programs.

"Even with such preparatory periods and the resulting expansion which placed all branches of the industry on a substantial basis, it still took a long time before the first deliveries of both merchant and naval vessels could begin under war contracts. In both cases an adequate merchant fleet and Navy in being would have played a vital role in war effort and would have minimized the time, cost and manpower of the following war production programs.

"Between the wars, the industry was at a low ebb with periods of minor activity but with no continuity of business. Facilities and technical staffs were seriously reduced, finances depleted, and some yards liquidated while others narrowly escaped liquidation. This period demonstrated that shipyards cannot be successfully adapted except to a small degree to other types of work.

"The present outlook for new ship construction, either merchant or naval, based on present contracts and business in sight, is very gloomy.

"A repetition of the disastrous conditions, even worse than those prevailing during the period from 1922 to 1937, is imminent unless some constructive action is taken. Under existing conditions, the Government, directly or indirectly, is the principal customer of the industry, as it was before and during World War II.

"This industry, unlike other industries, was unable to return to a domestic market for business, after the war. Practically all heavy and manufacturing industries were faced with a huge backlog of civilian demand for their prewar products, which facilitated their reconversion from wartime production.

"Cancellation of all but a few wartime ship construction contracts after the war, left the industry substantially without employment for the skilled technical staffs responsible for the success of the war program and is resulting in the rapid dissipation of such vital staffs.

"The character of the industry is such that it must rely on a comparatively few contracts in substantial amounts for an intricate and highly technical custom built product, usually unique, and at best not more than two or three of the same type. Other industry generally manufactures large volumes of identical units of relatively small value by mass production methods for sale to the trade. For this reason and because of high material costs and labor costs far in excess of foreign labor costs, the industry can not compete for an export market.

"All other maritime nations, except the United States, are building up their merchant marines by the construction of needed ships of the most modern types.

"From the foregoing, the vital part played by the industry in time of emergency becomes evident and establishes the necessity, not only for the existence of the industry in normal times, but for its active and efficient operation in such times to provide the vessels required in case of a national emergency.

"The accomplishment of these two objectives by the establishment of a sound and coordinated long-range shipbuilding program will serve the requirements of national security and the national policy of developing and maintaining an efficient and adequate American-owned merchant marine. Both are indispensable to the national welfare and to the present and future international position and responsibility of the United States."

Walter C. Hemingway, vice president and general manager of Federal Shipbuilding and Dry Dock Company, presented the "Essential Characteristics of the Industry," and concluded with these remarks:

"The gist of the essential characteristic of shipbuilding is first to design a ship which will reliably accomplish its exacting purposes with the least propelling power and the most space for revenue cargo and personnel, while offering the most protection against damage or destruction from the perils to be encountered during its long life at sea. The more successful this phase is accomplished, the more difficult becomes the next one, which is to specify, procure and install an enormous quantity and variety of custom made materials to function as a unit in the crowded and irregular shaped interior spaces remaining in the hull structure.

"The nucleus force of shipbuilding employees must necessarily have considerable experience and continuous practice to perform such work with skill and speed. They can be held together and replaced by younger men only by the building of ships. There are no substitute products which will occupy the experience of all these skilled shipbuilders or attract and teach the younger men needed for their replacement.

"The building of complicated ships therefore involves problems that are not found in the building of any other units of comparable dollar value and certainly the methods of building are necessarily the antithesis of mass production manufacture."

Joseph Haag Jr., vice president of Todd Shipyard Corporation urged that: "Provision be made for the construction, operation and maintenance of a modern all-purpose American Merchant Marine and Navy.

"That the maintenance of the merchant fleet be made the business of the privately-owned repair yards without competition from government projects.

"That the maintenance of the naval auxiliary vessels be divided in some ratio to be determined between naval shipyards and privately-owned yards in order that the workmen in the private yards may be made and kept familiar with developments in the field of naval construction.

"That the present government-owned repair facilities in private ship repair yards be made available to the private operators on some reasonable rental basis in order that they may be maintained for use in the event of a new national emergency.

"That repairs to vessels owned by the government be carried out more nearly in accord with commercial practice, to the consequent gain of both the government and the companies. With respect to the engineering and other technical aspects of the jobs, there is little complaint, but the present types of government contracts require such a monumental amount of other paper work that both the contractor and the Government dissipate funds in the maintenance of top-heavy administrative staffs."

J. F. Metten, chairman of the board, New York Shipbuilding Corporation, concluded his talk with these remarks:

"Trained and experienced technical staffs are vital. Once lost, they are difficult to regain. It would take years to do it and time is likely to be vital in another emergency.

"Therefore, this Country should make provisions to insure a volume of ship construction sufficient to enable the shipbuilding industry to maintain its technical position, which is so essential to our national security."

A. B. Homer, president, Bethlehem Steel Company concluded with:

"It is estimated that the annual dollar volume of business to maintain a nucleus shipbuilding program will run about $300,000,000 a year. This is less than 2/10ths of one per cent of the national income, and less than one per cent of the proposed national budget for 1947.

"Our plan contemplates that the Government, as a national security measure, make up any deficiency below the minimum operating level, so that the cost of the plan to the Government would not be $300,000,000 a year, but only the difference between that figure and that provided by current work in the yards. The only cost chargeable to the plan is that necessary to level off the curve of activity over a period of years and particularly to eliminate disastrous slumps.

"One of these slumps is now upon us. The industry's principal customer, the Government, has withdrawn from the market. It is estimated that by the end of this year there will be no ships on the ways and none to be laid down in private shipyards in the United States. The hour-glass of shipbuilding in this country will have run itself out.

"Unless something is done soon it will be too late. Since time will no doubt be required to work out an effective long range program to save the industry, an immediate stop-gap program is imperative because the disintegration of the industry has already begun, and unless something is done promptly, will be well advanced by the end of this year."

(Testimony of the National Federation and of individual ship operators will be published next month.)

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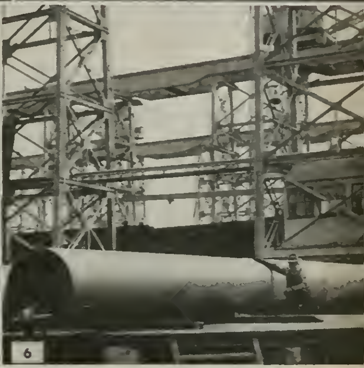

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Fig. 1. A longitudinal seam being welded mechanically on two halves of one section. Backing strips, tack-welded on the inside, hold the two halves together while this operation is being performed. Fig. 2. Closeup view showing where longitudinal and circumferential welded seams of two sections meet. Note the unusually clean appearance of the seam. Fig. 3. Two sections of kingposts are shown being welded together circumferentially. Fig. 4. Before kingpost sections are welded together, their ends are burned off square with a 15° bevel, as shown above. Fig. 5. This striking photo, looking into the 61 ft. long kingpost, shows a welder at work welding the backing strip under a circumferential weld where two sections come together. Fig. 6. A completed kingpost. This one is 61 feet 1⅜ inches long and weighs approximately 13 tons.

BETHLEHEM'S KINGPOST ASSEMBLY LINE

By V. A. Christensen, *Hull Superintendent,*
Bethlehem Steel Company Shipbuilding Division
San Francisco Yard

THE LAST OF 24 HUGE STEEL KINGPOSTS, fabricated at Bethlehem's San Francisco Yard on a virtual assembly line basis, are now on their way to Waterman Steamship Company's two yards at Mobile, Ala., where they will be used in that company's current program of converting three former C-3 type Navy baby flat-tops to commercial freighters.

These kingposts vary in length from 29'-1" to 61'-1⅜", the latter weighing approximately 13 tons. They were fabricated in sections from plates running from ⅝" thick up to 1½", which were formed in two halves on the Yard's huge 500 ton hydraulic press. They were then burned to ½ diameter, beveled, planed and put together with backing strips tack welded on the inside and then butt welded longitudinally with an a c automatic welding machine.

It is interesting to note that virtually all welding on this job was done by automatic welding machines. The only welding done manually was in tacking the longitudinal and circumferential backing strips to hold the sections in place. When all automatic welding on one post had been performed and the metal had been allowed to cool, circumferential backing strips on the inside were welded all the way around as required by the American Bureau of Shipping.

Bethlehem's fabrication procedure resulted in a remarkably speedy and highly satisfactory job.

10,000 SPECIMENS IN SEA WATER

The sea water corrosion testing station at Kure Beach, North Carolina, was established by The International Nickel Company in 1935 for the immediate purpose of comparing the corrosion resistance of low alloy steels with carbon steel. Soon other materials were added to the program so that eventually comparative tests were being made on all kinds of ferrous and non-ferrous metals and alloys. The testing facilities have since been further extended to observe the behavior of several kinds of protective coatings—both metallic and organic, including anti-fouling formulations, the effects of marine growth on wood as well as on metals, and even the results of exposure to sea spray and sea air upon rope.

THE NUMBER OF SPECIMENS now exposed in sea water is about 2000, and during the past 12 years the number of specimens so tested has been over 10,000.

All of this testing has been essentially a cooperative effort, involving Inco and producers and users of materials and coatings. Many of those interested in the tests have visited the test site each year when specimens are withdrawn from the water for examination. The average number of such visitors during the past five years has been about 100 per year, representing about as many companies, in addition to the various government services concerned with sea water and sea air corrosion problems.

The sea water tests originally were located in a channel through which sea water was pumped from the ocean into the bromine plant of the Ethyle Dow Chemical Company. The closing down of this plant two years ago made it possible to remove the structure to the basin formerly used as the intake for the pumps that supplied the water for the plant.

Here, the ocean is literally "put in a test tube," with the effects of the tides and other factors being captured exactly as they exist along the shoreline a few feet away, except that the bulkheads break the force of the surf.

Among the advantages provided at the test site are:

1. A continuous supply of full strength sea water, uncontaminated by industrial wastes, oil films or other pollution that interfere with tests in harbors or near big cities.
2. A relatively wide range of sea water temperature (45° to 85° F.).
3. A long season of growth of a large number of marine organisms (of particular value in studying anti-fouling alloys and coatings).
4. Protection against the physically destructive effects of storms and high waves.
5. A moderate fluctuation in water level which permits observation of waterline and intermittent immersion effects when desired.
6. Adequate protection to prevent the theft of or tampering with specimens.
7. The availability of personnel and mechanical equipment needed to erect the testing equipment, keep it in repair, and handle the heavy racks of test specimens.

Natural Conditions remove Limits on Studies

The necessity of providing facilities for the exposure of specimens to attack by sea water and marine atmospheres under natural conditions has been demonstrated by the limited practical usefulness of laboratory tests on relatively small specimens in simple salt solutions, synthetic or re-constituted sea water, or in salt spray boxes. Laboratory tests provide a valuable supplement to tests under natural conditions—particularly in preliminary investigations and in throwing light on the mechanisms of sea water corrosion and the factors that control it. However, sea water is something more than a mixture of chemicals, it is a living thing and its corrosive reactions over an extended period can be studied properly only by the exposure of specimens to attack under natural conditions.

Comparative tests at Kure Beach and in synthetic sea water in the laboratory conditions are quite inadequate for measuring the behavior of metals and alloys.

In the sea water tests most specimens are exposed on racks continuously immersed at a depth of from three to four feet. The structure and general views of the specimen racks as well as the method of putting the racks in place are shown in Figures 1 and 2.

Specimens Reveal Effect of Marine Foulings

The study of the anti-fouling characteristics of metals, alloys, plastics, and protective coatings has been an important phase of research during the past few years.

This phase of the investigation has been conducted with the active and invaluable cooperation of Professor William F. Clapp of the William F. Clapp Laboratorys.

The racks themselves, with the exception of those furnished by individual cooperating companies, are made either of Monel, or of an alloy which contains 70 per cent copper and 30 per cent nickel. Racks made of both these alloys are welded with Monel rod. The supporting rods are Monel. Some of these racks and rods have been in continuous use since 1935 and appear still to be as serviceable as ever.

Specimens are fastened to the racks by means of Monel machine screws. Galvanic effects are prevented by the use of bakelite insulating tubes over the bolt shanks and insulating washers between the specimens and the racks and the Monel washers under the bolt heads. Incidentally, some of the original lot of Monel screws and nuts are still in use and in excellent condition after 12 years. The efficacy of this method of avoiding galvanic action has been demonstrated by the absence of such effects on specimens of such materials as magnesium, aluminum and zinc coated steel.

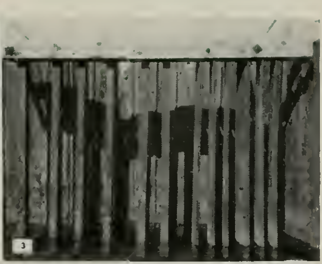
The period of exposure of a group of specimens may vary from six months (rarely less) to several years—the longest to date, twelve years. The number of specimens exposed varies from about 1000 to 2000, depending on the nature of investigations in progress.

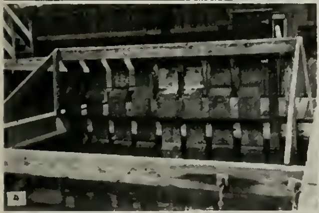
The need for more precise information on the ability of alloys to withstand the severe erosive effects associated with such uses as condenser tubes, pump impellers, propellers and underwater parts of fast moving ships led to the construction of the erosion testing apparatus, generally known as the "Whirligig," which is shown in Figure 5. The essential parts of the device are a large Monel disc, a "K" Monel shaft to which it is fastened, and motor and gears to drive it.

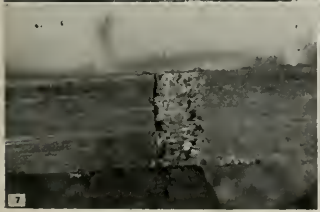
Condenser Service Simulated

Specimens may be fastened to this disc and whirled through the sea water at velocities up to about 30 feet per second, depending on the type of specimen and when it is placed relative to the center or the disc. All specimens are insulated from the disc and from each other. Condenser tube alloys are tested in the form of short sections of tubes placed in the brackets which simulate sections of tube sheets. As the disc revolves, salt water rushes through these tubular test pieces under conditions of great turbulence so as to result in erosive

Fig. 1. Marine testing basin showing intake. Fig. 2. Supporting structure, showing specimen rack supporting rods. Fig. 3. Piling test specimens. Fig. 4. Special steel test specimens. Fig. 5. Attaching test specimens to erosion testing disc. Fig. 6. Wood specimen removed for examination. Fig. 7. Same specimen as Fig. 6, with cut-away section showing results of teredo attack. Fig. 8. Examining see-spray test specimens. Fig. 9. Rope tests.







effects as severe as any likely to be encountered in condensers.

Another type of testing apparatus for measuring the effect of impingement upon condenser tube material is the aspirator-type jet impingement test apparatus. In it specimens are subjected to the action of submerged jets of salt water mixed with air bubbles.

The destructive effect on vulnerable materials as revealed by both of these testing machines has been so great as to result in as much erosion in a couple of months as ordinarily would be encountered in as many years. The nature of the erosion and the appearance of the eroded tubes have been found to be almost exactly like those associated with long-time condenser service. Thus, both pieces of apparatus give every indication of providing an unusually reliable and practical guide to the actual service which can be expected from condenser tube alloys and other materials proposed for use in sea water at high velocity.

Other possibilities of the high velocity apparatus include investigations of pre-conditioning by exposure at relatively low velocity, seasonal and temperature effects on erosion, effects of velocity on the adherence and growth of fouling organisms, the performance of antifouling coatings, and the adherence of protective coatings of various sorts.

Materials for Marine Pilings

In some cases it has been possible to expose specimens in the identical form and as nearly as possible under the identical conditions as a proposed use. An example is provided by some long-time tests on plain and alloy steels as they might be used for bulkheads or structural steel piling. These specimens are in the form either of interlocking piling sections or I beams, as shown in Figure 3. Each specimen is 36 feet long, driven 20 feet into the ocean bottom, with the remaining 16 feet extending above the mud line through the water and into the air.

The progress of corrosion is determined by periodic measurements of the decrease in thickness of the steel. These measurements are made with micrometers around the peripheries of the holes drilled for the purpose at intervals over the exposed length of the specimens. This test has already yielded interesting information about the distribution and extent of corrosion of the steels above and below the water and in the region between high and low tide level. A laboratory right at hand provides equipment for such studies as measuring loss in weight of samples, microscopic examinations, and the like, and checks each specimen, keeps an accurate record of time exposure, location on racks, and chronicles information on performance. It also includes a marine museum where sample specimens from the many studies are displayed. Every conceivable type of equipment and apparatus has been installed at the Kure Beach project to aid in the studies, and its value to industry has already been well proven.

Bolivia Bumps Her Nose Off Nantucket

The Scandinavian-American Line freighter, *Bolivia,* entered the Todd Shpyards Corporation Brooklyn Division, to have her wrinkled bow rebuilt. She had her nose pushed in last June off Nantucket Island when another cargo vessel decided to try the old Eskimo pastime of rubbing noses. Believe it or not, the *Bolivia* came off the better of the two. "You should have seen the other fellow," a company representative commented.

The Bolivia

The reconstruction work on the *Bolivia* involves a total of 53 plates, covering an area of about 3500 square feet, on port and starboard sides. One plate is to be faired in place; five are to be removed, faired, then reriveted back in place, and the rest are to be replaced entirely. In addition 17 internal frames in the bow have to be removed and renewed, as well as the collision bulkhead and numerous other bulkheads.

Approximately 100 square feet of deck on the fo'c'sle head, 800 square feet on the weather deck, and 420 square feet on the 'tween deck, have to be renewed, together with beams, longitudinals, girders, headers, brackets, etc. The hatchways to the No. 1 hold forward and the fo'c'sle storerooms require considerable replacement of parts, piping, plating, and shelving. Electrical lines, controls, and fixtures, and all plumbing fixtures, vents, and pipes in way of the damage are also to be removed.

The diesel-propelled cargo-passenger vessel was built in Denmark in 1943, and forms part of the Scandinavian-American Line's cargo fleet of more than 80 vessels. Normally, she operates between New York and Oslo, Copenhagen and other Scandinavian ports; Gdynia, Poland; and occasionally to South America.

TURBINE-ELECTRIC PROPULSION ON CLEVELAND AND WILSON

By HUGHES W. OGILVIE, sales engineer with
General Electric's Federal & Marine Section.

CONCLUSION

Braking and Reversing Torque of a Synchronous Propelling Motor

There are two methods of applying reverse torque on a propulsion motor of the synchronous type. These are:

1. Plugging the motor on its squirrel cage starting winding.
2. Temporarily turning the motor into a hydro-electric generator by applying field excitation to the rotor field poles and absorbing the power produced in a resistor bank.

Before selecting either of the above two methods the designer should be given complete information regarding the stored energy to be absorbed by the motor in the process of slowing down the ship and the time element involved.

Consider first the plugging characteristic of the low resistance squirrel cage winding which is imbedded in the pole faces of the rotor poles for use as a starting winding. Fig. 6 shows the calculated torque curve of the synchronous propulsion motor on the P-2 vessels while operating on its squirrel cage winding, superimposed on the propeller torque curve.

The motor torque curve is that obtainable with the turbine-generator speed reduced to a maneuvering speed of approximately 20 per cent normal speed, with the line contactors closed for astern operation and with 300 per cent normal field excitation on the generator.

It will be noted that the motor torque curve falls

EDITOR'S NOTE: On June 30 the Northern California Section of Naval Architects and Marine Engineers heard a very well prepared paper on Turbine-Electric Equipment. Part of the paper was published in August Pacific Marine Review.

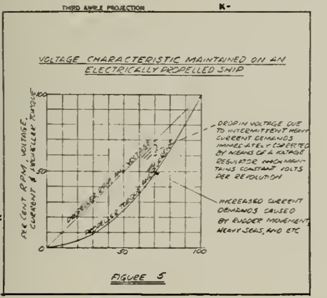


FIGURE 5

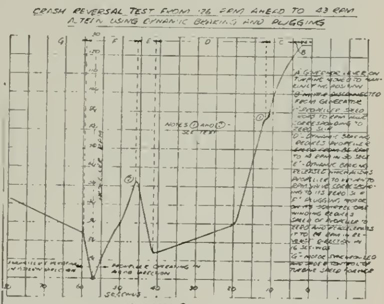


DIAGRAM 9

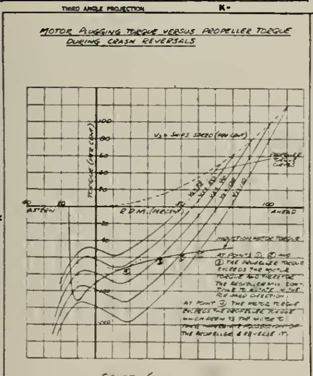


FIGURE 6

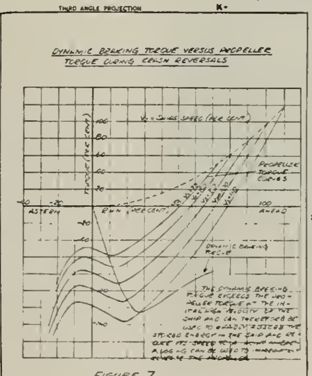


FIGURE 7

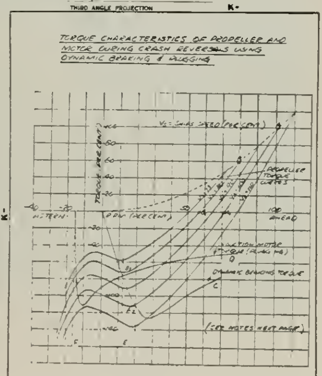
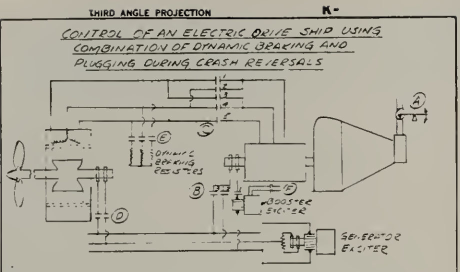


FIGURE 8

CONTROL OF AN ELECTRIC DRIVE SHIP USING COMBINATION OF DYNAMIC BRAKING AND PLUGGING DURING CRASH REVERSALS



1 RETURN SPEED LEVER Ⓐ TO MANEUVERING POSITION
2 " FIELD LEVER TO OFF POSITION. THIS OPENS FIELD CONTACTORS Ⓑ AND Ⓓ
3. " REVERSER LEVER TO OFF POSITION THIS OPENS CONTACTORS Ⓒ
4 CLOSE DYNAMIC BRAKING SWITCH THIS CLOSES CONTACTORS Ⓓ AND Ⓔ HOLD IN THIS POSITION UNTIL RED LIGHT GOES OFF AND GREEN LIGHT COMES ON
5 MOVE REVERSER LEVER TO ASTERN POSITION THIS CLOSES CONTACTORS Ⓒ 2, 3, AND 5
6. MOVE FIELD LEVER TO POSITION "ONE" THIS CLOSES GENERATOR FIELD CONTACTORS Ⓑ 1, AND 3 AND APPLIES EXCITATION TO BOOSTER EXCITER Ⓕ HOLD UNTIL MOTOR HAS REVERSED AND COMES UPTO SPEED AS INDUCTION MOTOR
7 MOVE FIELD LEVER TO POSITION TWO THIS CLOSES MOTOR FIELD CONTACTOR Ⓓ AND SYNCHRONIZES MOTOR
8. MOVE FIELD LEVER TO POSITION THREE" THIS SWITCHES GENERATOR FIELD CIRCUIT BACK TO NORMAL BY OPENING Ⓑ 3 AND CLOSING Ⓑ 2
9 MOVE SPEED LEVER Ⓐ FOR DESIRED SPEED

DIAGRAM 10

below the propeller torque curve when the ship is moving ahead at 100 per cent speed. As the ship's speed is reduced, partially by its own wave making and skin resistance and partially by the counter torque applied by the motor, the propeller torque curve also falls to a lower value.

This tug of war between opposing forces, that is the stored energy in the ship on the one hand, and the motor aided by the hull resistance on the other, continues to exist until the motor torque overcomes the ship. As soon as this point is reached, the motor takes possession of the propeller and brings it through the stop position to the reverse position. At the zero rpm condition the motor has plenty of torque to do the job quickly. In fact, it is only at the tail end of the motor torque curve where trouble is experienced.

The thing that is important is the time element involved in getting possession of the propeller, as during these periods of high motor slip, the current is quite high in the squirrel cage winding and this current in turn causes heating.

In single screw ships of moderate speed, plugging a motor on its squirrel cage winding has proven sufficient. The time element involved in getting possession of the propeller has been short, rarely exceeding 15 to 20 seconds even during crash reversals from full speed ahead.

In light, high speed, twin-screw ships in which the wave making resistance is quite high, the use of the squirrel cage winding for plugging has also proven satisfactory.

The second method of absorbing the stored energy of a ship due to its forward motion is to convert the propulsion motor temporarily into a generator and absorb the energy produced in a bank of resistors. To accomplish this purpose the main line contactors between the generator and motor are opened, field excitation applied to the rotor, and a bank of resistors connected to the motor stator leads. The ship then drives the propeller as a water turbine, and the water turbine drives the propelling motor as a generator.

The effectiveness of a synchronous motor, when used as a generator depends upon its speed and field excitation.

Diagram 7 shows the torque value of the foregoing dynamic braking circuit superimposed on the propeller torque curve. It will be noted in this curve that the motor torque curve is higher than the propeller torque curve. Its action is therefore both rapid and effective for absorbing the initial lack of the torque load and rapidly slows down the ship and propeller speed to a point where it can be handled by the squirrel cage winding.

It will also be noted that, at zero speed of the pro-

(Please turn to page 108)

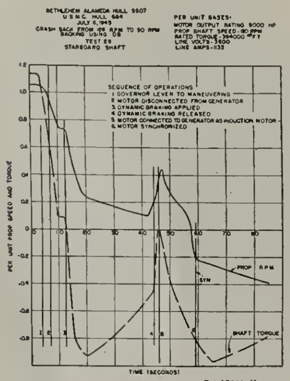


DIAGRAM 11

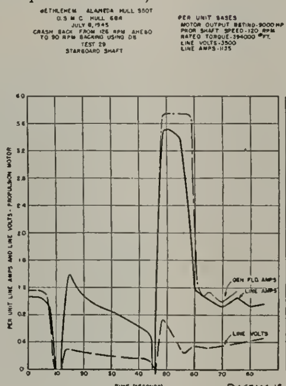


DIAGRAM 12

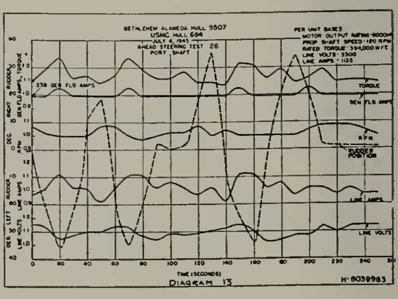


DIAGRAM 13

THE SHIP'S GALLEY

PART III - SMALL MODERN GALLEYS

By A. J. Dickie

IN AMERICAN PACKET AND CLIPPER SHIPS the galleys are located usually at the forward end of the forward deckhouse.

This house was usually located with its forward end just aft of the foremast and 16 to 20 feet aft of the break of the forecastle. The galley would usually run the full width of this house, 20 to 26 feet and would have a length fore and aft of from 8 to 12 feet, depending on the number of passengers.

A coal burning stove or range, with from four to 12 plate openings and one to three ovens, would be installed and sometimes a bain marie or steam table heated by hot water coils from the range. Large kettles, pots, frying pans, skillets and coffee urns, all usually of copper, took care of boiled and fried victuals. Baking was done in the range ovens.

A chopping block, a cleaver, knives, and a bone saw enabled the cook to act as butcher. Ladles, spatulas, toasters and many other utensils helped the cook and his boy to serve the crew and keep the waiters busy.

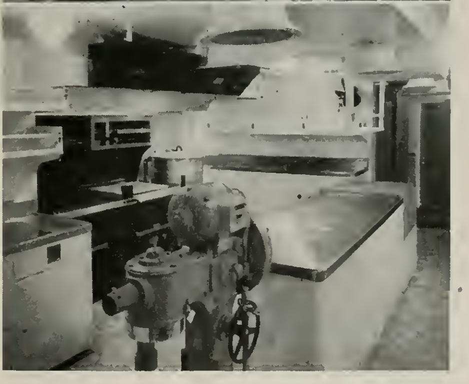
The stove or range usually had a stove pipe chimney carried through the house ceiling and weather deck, in a casing arranged to insulate the hot pipe from the wood, and to prevent leakage of rain or sea water into the galley. Many are the tales of galley chimneys carried away by high seas when ships were "hove-to" in long storms. In such a case fires usually had to be put out and "no cooked food" might be the order until the weather had moderated. Great was the reputation of those sea cooks who, in such times, were clever enough to maintain sufficient fire to have hot coffee or occasional soup.

On steamers of those days, conditions were similar

At top: Galley on the Yacht Norab, showing tiled sink and range hood.

Mess Room on the Chicken-of-the-Sea.

Galley of the Columbine, featuring Ingle range and Frigidaire cabinet.



At bottom: Galley on C-2 completely electric seen from starboard to port. In foreground is mixer in background is Hotpoint electric range and soup kettle. Door at rear is to port shelter deck passageway.

Officers Pantry on a C-3.

to, and in many instances worse, as the power driven craft, which, in trying to maintain schedules, would drive into headwinds and thus take on seas and produce chaotic conditions on deck. The reader is referred to Charles Dicken's "American Notes" for vivid descriptions of conditions during his voyage out to America on a steamer and his return voyage by preference on a sailing ship.

As steamers grew in size and power, the equipment and layout of galleys gradually improved, being somewhat handicapped in its rate of improvement by the limitations of coal as a cooking fuel. The introduction of refrigerating machinery in the late 1860's was a great milestone in the evolution of marine cookery, although the weight and cost of the old so-called "dense air" refrigerating machinery limited its marine application. On the Pacific Coast, oil was introduced as fuel under marine boilers about 1900 on steam schooners, and in 1902, the *Nebraskan* of the American-Hawaiian Steamship Company, was converted to an oil burner. Her remarkable savings over her own coal burning costs and earnings directed the attention of the shipowners of the world to the advantage of oil fuel. Many new vessels were fitted to burn this new source of power.

Almost immediately oil burning galley ranges appeared and the design and arrangement of marine galleys took a long step forward. The cook was now free from the dirt of coal and had at his disposal a constant and easily regulated source of heat. Galleys could now be arranged more compactly and more conveniently. Service pantries wherever needed could be provided with small ranges with fuel piped and ready to use, so that they became, in effect, kitchens on a small scale.

Another great forward step was the introduction of electricity as a source of heat in marine galleys. This occurred during the second decade of the 20th Century, and practically every galley in new ships today is either partly or entirely electric.

Small Galley Design

Many factors enter into the design and arrangement of galleys and of galley equipment. Among these factors are: space available; location in relation to dining rooms or mess halls; location in relation to food storage, particularly refrigerated stores; ventilation; sanitation and the rules of U. S. Health Department; choice of non-corrosive materials for built-in features; choice of non-skid deck covering; and fireproofing.

The great majority of ships plying the seas are cargo vessels and their galleys are designed for feeding the regular crew. The design problem here is comparatively simple. Sufficient capacity in space and equipment to prepare meals for from 30 to 55 persons, and an arrangement and location to take care of two mess rooms, one for officers and one for crew. Just as in the sailing ships, the galley of a modern cargo vessel is in one of the deckhouses, with the crews mess room adjacent, and the officers mess either above or close by.

One of the most interesting and best designed cargo vessel galleys that has come to our attention is that on the Norwegian motorship *Handicap,* built at Stavanger in 1921. This galley is located next to the engine room casing and is approximately 24 feet athwartship by 10 feet fore and aft. The deck is completely covered with a vitreous tile, having chamfered edges and set in cement. The chamfers form channels between the tiles that drain off into a sump connected to the ship's bilge, so that the galley deck can be hosed off and will dry in a few minutes. Boundary bulkheads are finished in enamel paint in two colors.

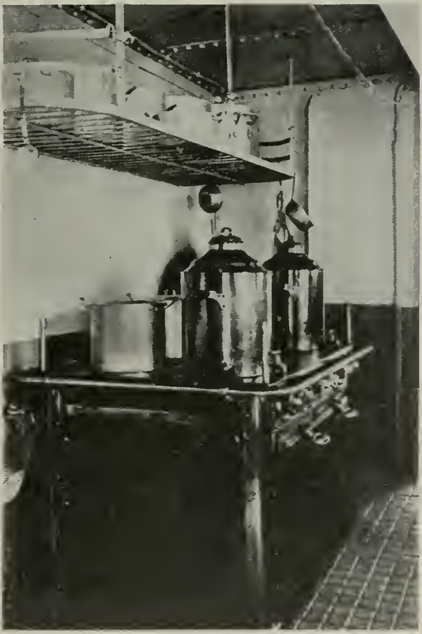
Several unique and interesting features are designed into the electrical equipment which includes: a six plate electric range; a large double boiler; a small oven; a large plate for deep frying; and a cabinet refrigerator. The double boiler is hung on pivots so that it can be tilted by a rack for pouring off or for convenience in serving. The large plate is enclosed in the cabinet of the cooks work bench and is hung in gymbals with a pendulum weight, so that it is practically unaffected by the motions of the vessel. The cook, with this apparatus, can deep fry in almost any weather. Our illustrations, show the range, the double boiler and some of the utensils.

Another unique feature of this galley is the built-in oven which projects through the bulkhead into the exhaust from the main engines and so maintains a temperature of 300° F plus, while the ship is under way at sea. This oven has ample capacity to bake all the cake, bread, pies, or puddings, consumed by the crew of 35. All roasts and other oven products requiring a greater sustained temperature, are taken care of by the large capacity ovens in the electric range.

Note in the illustrations the hood over the range to take care of heat and of vapors; also the slotted posts on the range corners. Steel bars are dropped into the slots to prevent pots sliding off the range in rough weather.

Another illustration shows the galley of an American lighthouse tender built in 1931. This compartment has

The range and galley on the Norwegian Motorship Handicap built at Stavanger in 1921. (Complete description of this galley is found in the text on the opposite page.)



colors—and it is fitted with skylight and it has several built-in features. An eight plate built-in oil burning range takes care of the cooking. This range, through a water back and insulated storage tank, takes care of hot water service. The built-in cabinet sink is apparently piped for hot and cold water but a hand pump is installed either for emergencies or for salt water. Note the large capacity electric refrigerator in the corner.

Another example of modern simplicity is the galley and mess room combined on a large fishing vessel. We illustrate one such from a tuna clipper. Here as in the lighthouse tender, we have an oil burning range and electric refrigerator and built-in work bench and sink.

A more elaborate galley and one that illustrates the possibilities for producing decorative effects by judicious choice of available materials is that on the yacht *Norab,* with its deck and bulkheads entirely in decorative tile effects. At first glance, one would think that these tiles with so many re-entrant angles would crack and break loose with the working of the vessel, but so far as we have been able to learn, the experience has been quite satisfactory.

Probably the most elaborately equipped and most costly galleys ever designed for cargo vessels were those installed on the C-1, C-2, C-3 and other U. S. Maritime Commission freighters. In addition to the all-electric equipment of ranges, bake ovens, boilers, and other devices for simple cookery, these ships were equipped with electrically operated dough mixers, coffee urns, waffle irons, meat grinders, meat slicers, dish washers, toasters, griddles; in short, practically everything that would be required in a first-class small hotel ashore. The galleys on these ships are located on shelter deck amidships and are adequately ventilated and air conditioned. All deck surface is covered with non-slip tiling. The trim is either monel or stainless steel. All bulkheads and vertical surfaces of the built-in cabinets are painted in white or ivory enamel. The worktable tops, sinks and drain boards, are stainless steel or monel. Every available space is fitted with racked shelves.

Adjacent to the officers' mess and recreation room these ships are fitted with a complete electric pantry that is equipped to keep food from the galley hot or cold, and to prepare coffee, broil steaks, make toast, cook waffles. In a word, this pantry is a short-order kitchen.

Standard C-3 cargo carriers are equipped to take 12 passengers. These passengers eat in the officers mess. There are 55 in the crew, including 10 in the stewards department. Thus 19 per cent of the crew is required to feed the crew. For such a crew in the old sailing ship days, one cook and a boy, with no labor-saving machinery, were sufficient to feed the lot. The sailing ship cook and his boy got about $65.00 per month between them. At present the combined monthly earnings of the ten men in Stewards Department figures at $2445.30.

"Wooden ships and iron men" seems to have been a well-founded phrase as applied to the old sea cooks.

Interior view of American President Lines' new Southern California passenger offices, designed by Walter Dorwin Teague and Associates. The "viewers" set in the counter are for the insertion of colored slides with Round-the-World scenes as well as features on shipboard.

REDESIGN FOR POSTWAR TRAVEL

By ELEANOR G. REID

PART I

WHEN THESE NEWLY REDESIGNED PASSENGER OFFICES were formally opened by American President Lines in San Francisco, Los Angeles and New York this spring, the public was introduced to ticket offices thoroughly postwar in character, inside and out, as efficient as they are attractive. Patrons and prospective travelers find countless refinements in design conducive to their comfort and convenience while selecting travel accommodations. Here are novel devices and arrangements for displaying travel data fully and vividly. The staff, too, from counter clerk to manager, find every convenience for their work, in a setting not only bright and comfortable but also expressive of the spirit of modern world travel.

The new offices constitute a good example of design for business: they combine the complementary assets of physical attractiveness and functional efficiency.

The Industrial Design staffs of Walter Dorwin Teague's East and West Coast offices worked concertedly with American President Lines' executives to realize the unanimity of design theme and practicability in physical layout that characterize all three offices.

Los Angeles

How to create a spacious and efficient interior in a deep, high, narrow space with a mezzanine at the back was the design problem. The new passenger ticket office had to be reconstructed on the same premises as before the war. The location itself was highly competitive: the middle of a block already filled with other modernized travel offices.

An "open-front" was found the best solution, and the entire ground-floor of the ticket office was converted into a huge show window. Cross-beam and transome in the facade were eliminated in order to carry plate glass up to the full ceiling height, and the Herculite door assures an uninterrupted scheme. The entire front office interior is exposed to the passerby.

The open-front aspect was enhanced: (1) By the ceiling structure. From the outer edge of the high projecting canopy in front, the ceiling was slanted downward and backward to the floor level of the mezzanine in the rear. This mezzanine, air conditioned, thus became usable (as it was not before) for second-floor office space, and the effect of height in the front office was not diminished. (2) By carrying the three ceiling lighting troughs in unbroken lines from the front canopy through to the rear partition. (3) By the entrance planting on either side of the window glass, which serves merely as a weather-screen.

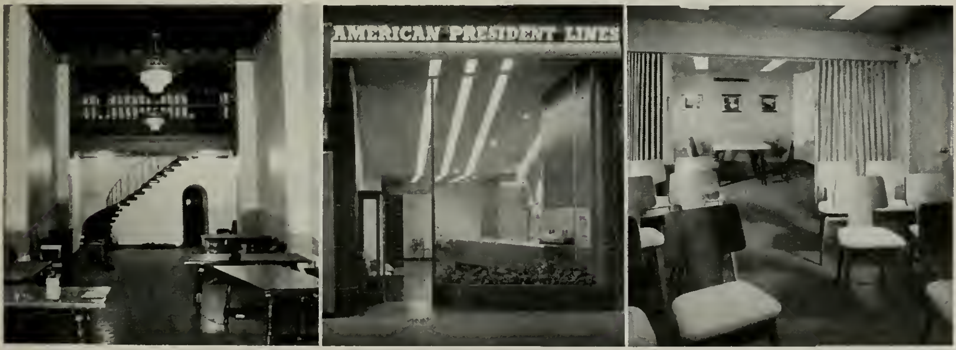
Two features were incorporated to assure immediate company identification of name and business purpose: a world map with American President Lines' Round-the-World routes in Neon, filling one entire wall of the public space and strikingly visible from the street, and a ship model beside the entrance. The company name and house flag are strategically displayed.

Sweeping changes in plan and space arrangement were necessary to provide for maximum efficiency in operation. This office is devoted exclusively to public passenger service on "President" ships to the Orient and scheduled Round-the-World cruises. (Freight and other maritime services are conducted in offices elsewhere.) Office requirements included:

Public space for travel and accommodation information and ticket purchase; semi-private space for consultation on more extensive trips and accommodations; private conference room; projection room for travel films to be shown to small groups, travel clubs, etc.; executive office space; clerical and filing office and basement storage space; toilet facilities.

A number of structural changes were made in addition to sloping the hung ceiling of the front office. This ceiling is faced with acoustical tile, with flush cold cathode tube lighting fixtures. The side walls were furred out to the face of projecting columns, even at the sacrifice of a foot or two of width, in order to provide smooth wall surfaces. The entrance walls are veneered with ceramic tile, which is carried back as a dado along one wall of the public space. Partitions on both first and second floor were rearranged; the stairs were moved; air conditioning was installed; new and attractive lavatories were provided.

In the front office space, a rift-oak counter is set at an angle under the wall map, so as to present itself invitingly to the customer entering. This counter has convenient storage facilities for necessary items such as tickets, literature, validators, and telephones. Each clerk's station is provided with a Kodachrome viewer set in the front edge of the counter, and files of 5x7



At left: Interior of American President Lines ticket office in Los Angeles before redesigning. Note the curved staircase, which has been removed and a straight staircase (shown in center view) installed. Center: View from street showing show window aspect of ticket office, map display, ship model, planting and lighting. Spaciousness created in a narrow space by plain areas, sloping ceiling upward to full height at entrance and enhanced by color and simple detail. Overhead canopy and letters in stainless steel. At right: View from projection room through to conference room. Modern fold door separates the space. Pictures in wall are color transparencies of ship accommodations.

These photographs are through the courtesy of Walter Dorwin Teague.

color slides are stored in a drawer back of it. The viewer consists of a diffusing glass lighted by five small fluorescent tubes. The clerk can quickly show customers a series of brilliant color photographs of ships and ship accommodations, picturesque foreign scenes, etc.

The counter top is of cigarette- and scratch-proof Realwood Formica, matching the rift oak of the counter front. Counter legs are faced with black rubber to prevent marring, and the fact that the floor extends under the counter without interruption adds to the effect of spaciousness.

The most striking feature of the public space is the huge map of the world filling the wall back of the counter. Its land areas are raised in a relief and rough-coated in a warm terra cotta color. Ports of call are marked by amusing cut-outs in gay-colored plastics, and the route connecting them is a line of red Neon. The sea areas are a cool light blue.

The wall opposite the counter, where comfortable seats upholstered in a terra cotta color are placed, is sand-finished plaster painted in cool yellow, as is the ceiling. Soft blue-green tones are used in the asphalt tile floor and the ceramic tile at the entrance. This color scheme as a whole is suggestive of the Pacific Islands, recreating the mood and atmosphere of Pacific travel,

(Please turn to page 114)

PROPANE TANKER

Plans for the transportation of propane fuel by ship, aimed at helping to solve the gas fuel shortage in the New York area, are announced by officials of the Warren Petroleum Company of Tulsa, Oklahoma. The initial trip is scheduled for next fall.

The ship, the *Natalie Warren,* now being converted to a specialized tanker at Beaumont, Texas, will carry 1,300,000 gallons of liquid propane per trip, and will make two trips per month from Houston, Texas, to the New York area. When reduced to commercial gas, this will mean an additional supply of 400,000,000 cubic feet per month for New York and vicinity, or enough to supply 285,000 homes and apartments. The average city or suburban home, it is estimated, uses 1400 cubic feet of gas per month, principally for cooking and hot water heating.

Propane has never been transported by ship before in quantities shown above, but has been carried in railroad tank cars. The ship will carry the equivalent of 280 tank cars per month. These now can be released to bring additional fuel to New York and other areas, representing a large net gain in the overall U. S. fuel transportation network.

Essential to the process of unloading the propane from the ship is a centrifugal gas compressor and auxiliaries made by Carrier Corporation, Syracuse, N. Y., a leading supplier of centrifugal gas compressor equipment in the oil and gas industry.

After the liquid propane has been removed from the tanks, the tanks remain filled with gas amounting to approximately 266,000 pounds. The compressor will deliver this gas into a condenser where it will be liquefied and transferred to the shore storage depot.

Liquid propane, when converted into gas, can be introduced directly into city gas mains to supplement utility company supplies of manufactured gas.

Shown above are two of the many huge tanks being installed aboard a specialized tanker by the Warren Petroleum Company for the first large-scale transportation of propane fuel by ship. The vessel will bring the liquid equivalent of 400,000,000 cubic feet of propane gas to New York each month to help relieve the fuel shortage.

Below: The S. S. Natalie Warren, now being fitted out by the Warren Petroleum Company as a specialized tanker to carry 2,600,000 gallons of liquid propane per month from Houston, Texas to New York. A special centrifugal gas compressor supplied by Carrier Corporation, Syracuse, N. Y., will save 266,000 lbs. of propane gas each trip by condensing the gas remaining in the emptied tanks into liquified propane.

ELECTRIC EQUIPMENT ON FLOATING DRY DOCK

Many types of floating dry docks were built during the war. Largest and best known were the advance base sectionalized dry docks—ABSD's—made up in individual sections that, when assembled, were capable of docking the largest battleships. Of no less importance, however, were the small integral 6000-ton docks used for overhauling smaller units of the fleet as well as the all-important fleet auxiliaries. Westinghouse Electric Corp. comes up with an interesting list of equipment furnished by them, the major units of which are as follows:

Figure 1: Main switchboard set with starter and switchboard in background. This set operates at 1175 rpm to convert a.c. supplied from main diesel driven generators into d.c. for ship's service use. Figure 2: Ship's service switchboard and motor starter (in foreground) for 3-unit ship's service motor-generator set (in background). M-G set is driven by a 250 hp a.c. motor. Two 75 kw, 125 volt d.c. generators are on either side. By means of three-pole double-throw knife switch on switchboard just below the handrail, the two generators may be connected in series or parallel as desired. Motor starter is in dripproof cabinet at the right end of switchboard and is of autotransformer type magnetically operated from push-button on left-hand panel of switchboard. Figure 3: Four hundred kw, a.c. diesel driven generator. This generator is dripproof protected and has a 7½ kw belt driven d.c. exciter mounted on top. Belt guard is in foreground. In background may be seen the 720 rpm driving diesel engine supplied by Chicago Pneumatic Tool Company. Figure 4: Main switchboard No. 2 serving one 40 kw diesel driven a.c. generator and one 150 kw diesel driven a.c. generator. Two panels on right-hand side of board contain meters, voltage regulators and field rheostats for each generator. Left-hand panel is bus tie panel for connecting this board to main switchboard No. 1, which serves two additional 400 kw a.c. generators. Remaining panel contains two 1000 amp. feeder breakers. Figure 5: Main switchboard No. 2 is in background. A 400 kw, 80 per cent P.F., 450 volt, 720 rpm, 3 phase, 60 cycle diesel driven generator is in foreground. This generator is one of a total of three that supply a.c. power to operate the main pumps that surface the dry dock. All pumps may be operated simultaneously, if necessary, since control is maintained from a single central station. Figure 6: The AFDL-47 as it neared completion during the outfitting stage of its construction. The dock is 448 feet long by 97 feet wide, and its wing walls tower 45 feet into the air. Seventy-three miles of welding went into its construction. Sixteen watertight tanks furnish the means for submerging or raising the dock.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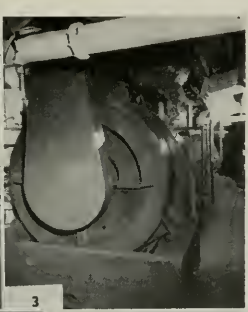
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George A. "Alec" Robinson, of Los Angeles-ong Beach Harbor

PORT ENGINEER OF THE MONTH

LOS ANGELES-LONG BEACH HARBOR

GEORGE A. ROBINSON, Secretary of Port Engineers

George A. "Alec" Robinson was born in the famous old shipbuilding town of Glasgow, Scotland.

He went to sea in 1929 on the Union Oil tanker *Uticarbon,* running out of Los Angeles to the East Coast. He was first an oiler, then a relief pumpman, and by February 1936, he held a second assistant license. In February 1936, he joined the Los Angeles Shipbuilding & Dry Dock Company at San Pedro and served in this yard until April of 1944, through the drafting and estimating departments. His next appointment was assistant manager and then manager of the Repair Department. It was in this yard that "Alec" gained both steam and diesel experience, as well as hull repairs.

In April of 1944, he went in business for himself, establishing his own office as Consulting Engineer and Surveyor; also as active Port Engineer for Sudden and Christenson, and for other companies during the war.

He is married and has a 9½ year old son David. David is the First Mate on the Robinson 46′ yawl, *Trident.*

--With The

PORT ENGINEERS AUGUST MEETING AT LOS ANGELES HARBOR

The Society of Port Engineers at Los Angeles Harbor held their monthly dinner meeting at the Hotel Lafayette in Long Beach on August 6, an unusually well attended meeting with "Ed" L. Ryan as host and sponsor of the program.

"Ed" Ryan, Los Angeles Harbor Area dealer for Gladding McBean marine refractories division, presented a very interesting and entertaining program having as guest speaker William Brandt of Gladding McBean's research laboratory. Mr. Brandt's subject was "Marine Refractories and Their Importance to Boiler Operation," which was accompanied by a color film showing the manufacturer's plant at Pittsburg, California. The film emphasized the methods of manufacture and testing of products for marine service. An open discussion followed the showing of the film, with Mr. Brandt inviting questions.

Then Mr. Ryan introduced Joseph Rhodes, vice president and sales manager of Gladding McBean & Co. and Hal Kolberg, of the sales department.

The remainder of the meeting was given over to the Society's regular meeting affairs, with Chairman of the Board Dan Dobler, marine superintendent of The Texas Company, presiding.

STRIP ON OPPOSITE PAGE:

At top: C. V. Peterson, Texas Co.; Joe Wossar, Matson Navigation Co.; S. F. Boomer, Lloyds Register of Shipping (Honorary member); C. I. Jackson; S. W. Simon, Pacific Far East Line; Joe Dennis, Craig Shipbuilding Co.; Lloyd L. Kennedy (Honorary Member), U. S. C. G.; and Ed Harris, Pope & Talbot.

Speaker's table: Ed L. Ryan, Harbor dealer for Gladding McBean & Co., sponsor of the evening; Dan Doblar, presiding chairman of the evenin, The Texas Co.; William Brandt, Director of Research, speaker of the evening; Joe Rhodes, vice pres. and manager of Refractories Division, and Hal L. Kolberg, Refractories salesman, all with Gladding McBean & Co.

Third down: Glann Gulvin, C. P. Snively, and Ed Lawlor, all with American Pacific; George H. McCoy, Marine Solvent Service Corp.; R. H. "Cy" Cyrus, Union Oil Company; H. Neergaard, Burns Steamship Co.; and Bert Hale of Marine Solvent.

At bottom: Joe Rhodes, Ed Ryan, William Brandt and Hal Kolberg, all with Gladding McBean & Co.

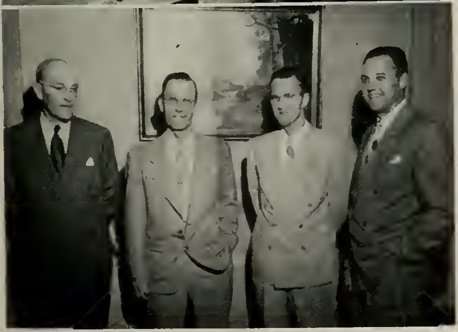
▲

SOUTHERN CALIFORNIA PORT ENGINEERS

Left to right, around the table: George Fryetta, Edward Pike, Harry Summers, Ed Kellenberger, Captaiin Theo. Peters, Joa Hare, George Ferry and Alec Robinson.

▼

Port Engineers - -



Left to right: Q. A. Herwig; Mickey Felton, port engineer, Alaska Steamship Co.; Earl Larievere, U. S. Maritime Commission; Jim Robinson, Lloyds; Mr. Stevens, U. S. Maritime Commission, and J. D. Clarke, at the "mike."

SEATTLE SOCIETY of PORT ENGINEERS

At the August meeting of the Society of Port Engineers of Seattle, held in the Rose Room of the Roosevelt Hotel, August 13, Harry Gamlen, president of Gamlen Chemical Co., gave a very informative talk and demonstration of various Gamlen products. The meeting was sponsored by Quentin A. Herwig, of the Marine Service, Inc., Seattle distributors for Gamlen Chemicals.

Attending the meeting from the Marine Service, Inc. were: Frank Jarvis, Kendall Neville, Captain E. J. Heinrici, and Quentin A. Herwig, in addition to Bill Robbins of Portland, Oregon.

Considerable time was given to answering of questions by Mr. Gamlen, who was not "caught short" by anyone.

(Other scenes of the picnic are shown on page 64)

At left: Mrs. J. D. Clarke, Mrs. Ed Tucker and J. D. Clarke.
At right: Quentin A. Herwig (walking towards camera), Marine Service, Inc., sponsor of the Port Engineers Picnic.

M. C. Wright, port engineer, Deconhil and Hillcone, and is on the Board of Governors, San Francisco Society of Port Engineers.

M. C. WRIGHT OF DECONHIL AND HILLCONE

An example of the wide experience that goes into the preparation of a marine engineer is that of M. C. (Charley) Wright, port engineer for Deconhil Shipping Company and Hillcone Steamship Company, who was born in Marion County, Ohio, in 1896.

His first job at sea was as a deck boy on Matson Lines *Enterprise* in 1923. He was in the "black gang" for Standard Oil of California from 1924 to 1928, and during that time he got his 3rd Assistant's license while on the *R. J. Hanna*. He also sailed on the *F. H. Hillman, J. A. Moffet, H. M. Storey*, and *J. C. Fitsimmons* for that company.

He was 3rd Assistant on the *Ecuador*, of Panama Mail Line for a short time, and then on the steam schooner *Davenport* until 1931. During 1931 and 1932, he sailed as assistant on the *Ruth Alexander* and *Admiral Halstead* for the Pacific Steamship Co., and in December of that year, he joined the *Santa Ana* of the Grace Line as 4th Assistant, then as 3rd, 2nd and 1st Assistant until the 1934 strike.

In October of that year he joined the *Lake Miraflores* as 2nd Assistant for the Santa Cruz Oil Co., an affiliate of the Hillcone Steamship Company. At the close of the fishing season in 1935, Wright went east to join the *Nelson* for Hillcone Steamship Co. as 1st Assistant, and brought that vessel to the West Coast that summer. He was appointed Chief of the *Edwin B. DeGolia* in August of that year by Hillcone Steamship Co.

In August 1936, he was transferred to the *American Fisher*, a modern floating fish reduction plant, and remained there until the fish reduction ships were voted off the coast by the people of California in 1939. After that, he transferred to the *Lake Miraflores*, which operated in Newfoundland and Labrador for one year.

Mr. Wright joined Alcoa Steamship Co. in 1941 and took the *Alcoa Patriot* out of the Bethlehem Yard, San Francisco. When he returned to San Francisco he joined Moore Dry Dock Co. as engineering co-ordinator and trial engineer in January, 1942. In October 1943, he returned to the Hillcone organization as Port Engineer of the Deconhil Shipping Company.

He travelled all over this country and abroad, during the war, to assist in keeping a large fleet of tankers delivering oil to the Armed Forces all over the world.

Charley is a member of the Board of Governors of the Society of Port Engineers in San Francisco. He makes a hobby of his work, which, with puttering around the house and yard, keeps him plenty busy.

PICNIC OF PORT ENGINEERS OF SEATTLE

Upper left: Balloon Race. Upper right: Earl Larievere, U. S. Maritime Commission, Johnny Wachtler, Luckenbach Steamship Co., J. D. Clarke, McGinitie and McDonald, & Jack Herring, Alaska Transportation. Lower left: Rolling Log contest; next: Partial view of assemblage at Port Engineers picnic in Seattle.

(Other views on page 63)

Pacific WORLD TRADE

Reg. U. S. Pat. Off.

By T. Douglas MacMullen

APL MAKES AN AIRLINE DEAL

A WORLD-GRIDLING SERVICE by both air and sea was made available to international travels under a far-flung cooperative arrangement between Northwest Airlines and the American President Lines.

The service covers NWA's own network extending from New York to Manila and the steamship lanes which extend to ports all over the world. Contributing to the service, either directly or as travel representatives, will be more than 100 agents and agencies in all parts of the globe.

Not a substitute, as many supposed, for the proposal by many steamship lines for the development of air services of their own; but rather a means of cooperative business development, the plan is expected to stimulate international air travel, and thus promote trade and better understanding among nations.

Under the arrangement, the American President Lines, as general agents, will represent NWA through its own offices and the offices of its agents throughout the world in soliciting air passenger travel. NWA, on its part, will represent APL in the solicitation and sale of steamship transportation.

Travelers, under the plan, can speed up their journey when that is urgent, or slow it down if more time is wanted to stay at some local point in any part of the world. Other advantages cited were these:

1. A customer can buy a ticket providing for the various travel combination he chooses.
2. Baggage can be sent ahead by ship.
3. Because of the importance of this new arrangement between the airlines and the steamship company, an extensive advertising, publicity and educational campaign will be carried out by both companies throughout the world.

The arrangement brings into close working conditions two outstanding transportation companies, both of which are world famous in their respective fields.

OUR WORLD TRADE DILEMMA

By Fred Christoph, assistant manager, U. S. Chamber of Commerce, Foreign Commerce Department

The United States today is shipping goods and services abroad at a rate which in 1947 may reach $20 billion. Imports may total $8 billion. The gap between exports and imports is $12 billion.

Of the excess about half is financed by loans and other aids from the U. S. government. There is growing concern as to where the dollars are coming from to maintain the present rate of exports.

It is recalled that after World War I exports reached a peak of $8.2 billion in 1920. In 1929, they were $5.2 billion; In 1932 $1.6 billion.

Warning signals already are out. June exports were off 13 per cent. Everyone wants the United States to be prosperous first and to see high levels of employment and wages maintained at a high level. Employment has reached the 60,000,000 figure .

Exports, a major prop to our present prosperity, amount of 7 per cent of total goods and services available in the U. S. Farm products exports will reach a value of $4 billion this year.

The world needs our goods . . . a great backlog of demand exists abroad. Much is needed to repair the destruction and dislocation caused by the war. We have been delivering in generous measure—a tribute to our productive system under free enterprise. We are the world's great workshop and for many things we are the sole suppliers.

We cannot expect to maintain the swollen value of exports now leaving our shores. We cannot continue to send our goods abroad upon a credit or loan or gift basis. We must face a day of reckoning. At the same time, the world is leaning heavily upon us to repair its dislocation and destruction. Never before has such great dependence and responsibility been placed on a single nation.

How long can we keep it up? The world wants our goods. But we must get something in return. There must be compensatory advantages. To sell our goods and services to other nations we must provide them with dollars with which to pay for our goods.

Pacific
WORLD
TRADE

Ways in which we can make a greater number of dollars available to foreign buyers are: (a) increased foreign travel; (b) importation and stockpiling of critical, strategic and other essential materials; (c) market analyses of U. S. markets and more effective merchandising methods on the part of foreign sellers; (d) studies to determine means of increasing importation of foreign products, including those that may be brought into the U. S. without the necessity of reducing tariffs; (e) liberalizing customs regulations and practices.

Were the U. S. today saddled with trade barriers between each state such as beset the rest of the world . . . import embargoes, import quotas and licenses, restrictive exchange controls, discriminatory trade preferences, to mention only a few . . . we, too, might be confronted with trade difficulties.

HONOR FOR LYFORD MORRIS

The National Board of Governors of Delta Phi Epsilon, National Professional Foreign Service Fraternity, has been transferred from Washington, D. C. to Oakland with the election of Lyford M. Morris as national president. Mr. Morris is the manager of the World Trade Department of the Oakland Chamber of Commerce. Oakland will be the seat of the Board until the next national convention of the fraternity in the middle of 1948.

Mr. Morris, who resides in Berkeley, is a former member of the board of directors and former president of the Junior World Trade Association of the San Francisco Chamber of Commerce.

Other new officers are: Joseph H. Maulhardt, El Cerrito, of the Atlas Power Co. in Richmond, general secretary; Wallace G. Holt, Berkeley, who is with Kaiser Engineers, Inc. of Oakland, secretary for Chapters; Fred C. Joss, San Francisco, secretary for Alumni Associations; and Reno J. Francheschi, also of San Francisco and head of the Building Material Department of Getz Brothers, treasurer.

Delta Phi Epsilon, which was founded in 1920, by and for young men interested in foreign service and foreign trade, has chapters and alumni associations located in the Los Angeles, Washington, D. C., New York City, Detroit, and Chicago areas in addition to the chapter at the University of California and Northern California Alumni Association in San Francisco.

A History of The Junior World Trade Association

By Joseph A. Wagstaff

John L. Stewart, past president of Junior World Trade Association.

Herbert Porter, new president of Junior World Trade Association.

THE JUNIOR FOREIGN TRADE ASSOCIATION was founded in July, 1938, as a result of the interest and efforts of two members of the Foreign Trade Association of the San Francisco Chamber of Commerce, Richard S. Turner and Edwin J. Macfarlan. These men, with foresight for the betterment of world trade and for the future of the younger men engaged in it, supplied the idea and encouragement which resulted in the first gatherings of the nineteen charter members of what now is called the Junior World Trade Association.

The organization was begun under the auspices of the Foreign Trade Association of the San Francisco Chamber of Commerce and ever since has enjoyed its sponsorship. The Junior World Trade Association is also an affiliate of the San Francisco Chamber of Commerce.

The plan of monthly evening dinner meetings was adopted and these have been held at various places regularly through the years. At the meetings members and guests have listened to speakers who are outstanding authorities and leaders in the many phases of world commerce and international relations. Members have educated themselves, holding open forums on topics of the day or describing and explaining to the group individual jobs and duties in trading concerns. Members of the Association as individuals or as committees handle a large share of the work and program of Foreign Trade Week, an annual national event designed to stress to the country as a whole the value of world trade to our economy and way of life.

The Junior Association enjoys close liaison with the older World Trade Association. Members of each are welcomed to the other's meetings.

On the lighter side, fun-loving Junior World Traders demonstrate their social spirit and conviviality by large attendance at the Family Picnic and the Christmas Party, both high lights of the annual program. Native talent has always been found within the organization to stage amusing plays and skits.

During the war, the Services drew heavily on the membership, and at the height of the conflict only a scant handful was available for the Association's activities which were steadfastly carried on. The veterans are still returning to the organization's rolls and are helping to push the membership up to its present count of some one hundred seventy-five. No member was called upon for the supreme sacrifice in the war effort.

Members of the Junior World Trade Association firmly believe theirs is the outstanding organization of its kind in the United States. In this postwar period and beyond, the Association recognizes and accepts the challenge of greater world trade with a spirit in keeping with its singular position in it.

BOOK FOR WORLD TRADERS

"International Contracts and the Anti-Trust Laws" by Harry Aubrey Toulmin, Jr., with an introduction by Homer Ferguson, United States Senator for Michigan. This book contains 1056 pages with bibliography, index and appendix. Publisher is W. H. Anderson Company of Cincinnati. Price $15.

How American business firms can consolidate their facilities and organizations to meet foreign trade competition without violation of the anti-trust laws is explained and documented in this new book by Harry A. Toulmin, Jr., of the Bar of the Supreme Court of the

(Please turn to next page)

BOOK REVIEW

(Continued from page 67)

United States and president of The Hydraulic Press Manufacturing Company. The author is senior partner of Toulmin & Toulmin, corporation and patent attorneys, with offices in the United States and England. He is also chairman of the board of The Tucker Corporation, automobile manufacturers, Chicago.

Eighteen essential factors involved in the negotiation and drafting of international contracts are developed in this book. Typical forms of agreements, indictments, complaints, and decrees, together with the full text of all related anti-trust laws, the Webb-Pomerene Export Trade Act, and coordinate and related acts are included in the book.

As Homer Ferguson, United States Senator from Michigan, writes in the introduction, "The book's real contribution rests in the analysis which it provides of the policy and statutes of the United States in relation to the rights, privileges and dangers of American private interests engaged in foreign trade control through the medium of international agreements."

"Mr. Toulmin has carefully depicted the conditions under which a person, firm or corporation may combine with others to form an association for foreign trading, so as not to run afoul of the United States statutes relative to restraints upon foreign or domestic commerce. The relationship between the Webb-Pomerene Act, the Sherman and Clayton Acts, the Wilson Tariff Act, the Federal Trade Commission Act and other statutes is fascinatingly presented with their attendant complications for the drafting of private international agreements."

TEA FROM JAPAN

Officials of Western States Tea Association and American President Lines were on hand to witness the unloading from APL's freighter President Madison, the first cargo of Japanese green tea auctioned to American importers since before the war. Watching as the cargo is unloaded at Pier 22 in San Francisco are (L. to R.) T. J. O'Rourke, director, Western States Tea Association; and M. A. Reilly, president, Western States Tea Association; W. K. Varcoe, freight traffic manager, APL; Alan McKay, secretary, Western States Tea Association; and Robert Reid, Freight Department, APL.

Pacific WORLD TRADE

LONG BEACH ENGINEER TELLS OF PORT'S FUTURE

At a well attended meeting of the Junior Foreign Trade Association of Southern California R. R. Shoemaker, chief engineer of the Port of Long Beach, outlined the present facilities and future plans of the port.

Mr. Shoemaker is well qualified to speak on this subject, as his office is charged with the maintenance of the present Port, and with all phases of planning for the future Port of Long Beach. Shoemaker stated that the Port of Long Beach is being built toward handling all general cargo for the Los Angeles area, while Los Angeles Harbor is handling more of the large bulk cargo, such as oil and heavy machinery.

The Port of Long Beach is now a 20 million dollar establishment, and comprises about 20 deep water berths, not all of which are covered as yet. The City of Long Beach is working toward building their Port to a 100 million dollar enterprise, which will cover a period from 20 to 25 years to accomplish.

The City has gained much of the revenue for building its Port from drilling for oil on City-owned or leased land. The U. S. Navy has done much to contribute to the building of a modern Port for Long Beach. According to reports and surveys made by the U. S. Maritime Commission, the Port of Long Beach is the most modern port in the country. The port authorities realize their position of keeping the port in a modern condition, and its facilities flexible under all conditions. They are constantly striving to keep their buildings and equipment modern. They have made provision for wide berths, with a wide apron, and double trackage on the apron, with ample roadway and storage facilities outside the sheds, to relieve possible congestion of the port area, and are doing all possible to modernize the rail and highway approaches ro the Port of Long Beach.

On the side, Mr. Shoemaker explained that the local ports rely almost wholly upon foreign trade, today, coastal and intercoastal services being nearly extinct. However, he believes these conditions are problems of economics, and will in time right themselves once again.

▲
Colonel Wiman's Patalita being hoisted aboard the Manulani at Pearl Harbor. The Navy's Pearl Harbor crane was needed for swinging this large boat.
▼

YACHTS COME HOME AS CARGO

No small feat was the completion of the voyage to Hawaii of the fine boats in the recent Los Angeles-Honolulu yacht race. Now they are homeward bound, and Matson freighters are doing the job.

The *Hawaiian Citizen,* which arrived in San Francisco August 1, brought:

Yacht	*Weight*	*Length*	*Mast*
"Tasco"	34,000#	50 ft.	65 ft.

Thomas A. Short, San Francisco, owner.

The *Hawaiian Educator* on August 7, brought:

"Getana"	23,000#	40 ft.	

R. S. Danforth, Berkeley, owner.

and the *Manulani,* which arrived in Los Angeles August 23 brought:

"Westward"	46,000#	67 ft.	85 ft.
R. Miller			
"Patalita"	81,000#	82′6″	105 ft.
Col. Chas. D. Wiman, owner.			
"Romni"	18,000#	46′6″	52 ft.
W. K. Cuthbert, owner			
"Medley"	24,000#	37 ft.	45 ft.

The pictures show *Patalita* starting home, "empty and up."

ARBITRATION CLAUSE IN WORLD TRADE CONTRACTS

World traders are again reminded that because of changing conditions in international trade, it is more important now than ever to use a standard arbitration clause in contracts. The following is recommended:

"Any controversy or claim arising out of or relating to this contract, or the breach thereof, shall be settled by arbitration in accordance with the Rules, then obtaining, of the American Arbitration Association or such other Rules as it may designate. The Association is authorized to make arrangements for this arbitration to be held under its Rules, or such other Rules at it may designate, in any locality or territory agreed upon by the parties, or failing such agreement, as designated by the Association. This agreement shall be enforceable and judgment upon any award rendered by all or a majority of the arbitrators may be entered in any court of any country having jurisdiction."

FRENCH NAUTICAL EXPOSITION

The XII^{e} Salon Nautique International will be held on the banks of the Seine between the Pont des Invalides and the Pont de l'Alma, in Paris, from Octobr 2 to 16, 1947.

It is reopening this year for the first time since the war, and promises to be most interesting, as it includes participants from all over the world. The exposition will show naval construction, warships, merchant marine construction, commercial vessels, pleasure yachts, as well as ship models; marine motors of all kinds, instruments, fittings, and furnishings for all ships, ship construction material, safety devices for marine use, ship armor and guns, port equipment, and numerous other features.

Information obtainable from: Le Salon Nautique International, 8, rue Jean-Goujon, Paris, (8^{e}), France.

Marine Insurance

How Much Is Marine Insurance?

AN OFTEN OVERLOOKED ITEM in the world trade picture, and its importance to the West, is marine insurance. While California—and San Francisco in particular—is the funnel through which insurance funds pass, there is a certain volume in other areas. And with an important part of American shipping under government operation up to and beyond July 1, 1947, the 1946 figures of the California Insurance Department fall far short of the Pacific Coast total. They are significant, however.

Marine insurance is divided into "ocean marine" and "inland marine," the latter including parcel post, canal and barge line, and other miscellaneous forms not properly "ocean." The following figures are further divided into stock company, U. S. branches of foreign companies, and reciprocals and reinsurance.

1946 OCEAN MARINE

	Premiums written	*Losses paid*	*Losses incurred*
Stock Companies	$16,031,577	$5,326,015	$12,907,595
U. S. Branches of Foreign Companies	2,194,224	858,899	799,859
Reciprocals and Reinsurance	204,060	19,673	49,172
	$18,617,468	$6,134,128	$16,594,871

(Some miscellaneous items included in totals are not detailed.)

1946 MARINE—OTHER THAN OCEAN			
	$18,972,309	$7,542,555	$ 7,996,864
Grand Totals	$37,589,777	$13,767,450	$21,785,105

Marine Insurance Course

The Association of Marine Underwriters of San Francisco is sponsoring a course in Marine Insurance with Donald Tormey of Marsh & McLennan, as instructor, which provides an opportunity for professional training to employees of the Association members, as well as the public.

The course will cover the syllabus of the Insurance Institute of America. The forms, principles and problems of insuring both cargo and hulls constitute the main part of the course. The insurance provided by the basic marine contract, the additional clauses required to satisfy letters of credit, the responsibility of the carrier under the bill of lading, the packaging and stowing of special commodities are examples of the subjects to be studied.

Classes will meet on Thursdays from 4:30 p.m. to 5:30 p.m., starting September 11, and on through May 20 at the Golden Gate Lecture Room, 537 Market Street (opposite Sansome Street). The fee is $25.00. Enrollment can be made at the Fire Underwriters Library, Room 818, Merchants Exchange Building.

The London Letter

By Our United Kingdom Correspondent

Concern Felt Over Ship Repair Costs

At the annual meeting of the Economic Insurance Company, Ltd., held in London, Sir Ernest Murrant, the chairman of the company (he is also the chairman of companies in the Furness, Withy group of shipping companies), said:

"We share with other companies engaged in similar business the general concern which is felt in regard to the uncertainties of the future in particular reference to the very high cost and the very serious delays involved in the matter of ship repairs. Notwithstanding the tremendous progress that has been, and is being, made in improving scientific aids to navigation, and the invention of new appliances, accidents to ships, and damage from heavy weather continue to occur as they have always done and always will do. It is our business to give our policy holders protection against the losses involved in such accidents, but we view with considerable alarm the heavy increase in the cost of repairs all over the world. There is no sign of any immediate diminution in those costs, which are aggravated in many cases by shortages of essential materials.

"Moreover, in respect of cargo insurances the very fact that so many things are in short supply, and consequently in great demand, has brought about a serious deterioration in what is politely called the moral hazard. In many respects the position is similar to that which existed after the 191418 war—theft and pilferage of cargo has increased in proportion to the general shortage of goods for which there is a quick market, and moreover it is a regrettable fact that one frequently finds an attitude of complacence on the part of the assured, amounting almost to indifference, of such losses provided they are amply covered by insurance. Underwriters as a whole are a long suffering body, but these points should all be borne in mind in considering rates of premium, which many of us would like to see reduced to a lower level, a desire which is not likely to be achieved so long as existing conditions continue."

British Ship Losses In War

The number of British merchant vessels (excluding fishing vessels) lost by enemy action during the recent war was 2,426, with a gross tonnage of 11,331,933. Of these 1,332 (7,595,645 tons gross) were destroyed by U-boats, 296 (816,255 tons gross) by mines, 209 (969,087 tons gross) by surface craft, 383 (1,575,230 tons gross) by aircraft, and 206 (375,716 tons gross) by other or unknown causes. Heaviest losses in numbers of ships were suffered in 1941 when 717 ships (2,824,056 tons gross) went down, 291 sunk by U-boats, 172 by aircraft, 76 by mines, 70 by surface craft and 108 by other or unknown causes. Total losses in the war years were:

Year	*No. of ships*	*Gross tonnage*
1939	96	419,015
1940	548	2,435,667
1941	717	2,824,056
1942	646	3,459,923
1943	273	1,514,221
1944	103	489,040
1945	43	190,011

In addition, 136 fishing vessels, of 24,525 tons, were lost. Here again 1941 was the heaviest year of loss, 55 vessels being destroyed.

Allied Merchant Ships Sunk by U-Boats

	1914-18 (51 months)	1939-45 (68 months)
Total gross tonnage of merchant ships lost by U-boats	11,135,000	14,573,000
Number of merchant ships sunk	4,837	2,775
Monthly average of merchant ships sunk (approx.)	95	41
Monthly average of gross tonnage sunk	215,000	215,000
Average size of merchant ships sunk (tons gross)	2,300	5,250
U-boats destroyed (approx.)	178	996

Admiralty Decisions

By HAROLD S. DOBBS *of San Francisco Bar*

STEAMSHIP COMPANY DOING BUSINESS WITHIN A STATE

DURING THE LAST FEW YEARS shipowners have been subjected to suits of one kind or another in states in which they merely have an agent who is not an employee of the shipowner but is strictly within the category and definition of an agent. Most persons recognize the fact that the operations of a steamship company are interstate and foreign in character and do not come within the category of intrastate business. The courts of many of the states in which our leading ports are located have taken a slightly different view of the characterization of the operations of steamship companies, and they have gone far along the road in finding some factor, usually of slight importance, upon which to hold that a steamship company is doing business within a particular state, even though the nature of their operations is only that of calling at a port of the state and discharging or loading cargo. Very few steamship companies are qualified to do business within the states at which they call with the exception of the state of incorporation, and this is so simply because they are not engaged in intrastate business. In many cases a shipowner will have his vessels calling at ports in other states which necessitates his selecting an agent, with whom he has no other relationship, and asking the agent to see to it that while his ship is in port, it is properly handled. The agent's duties are specific and usually terminate with the movement of the vessel to another port. In such cases the shipowner does not have any property, securities, office, or personnel actually em-

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ployed by him, within the state. The shipowner has no control over the agent in the manner in which he actually performs the task presented and it might be said that the agent is almost in the position of an independent contractor whose activities, if the agent were so defined, would not of course be taxed under any circumstances to the shipowner.

We have had a case decided very recently in the State of Oregon entitled *Burr vs. Pacific Tankers, Inc.*, in which that problem was once again placed before the court. The matter arises upon a motion made by the defendant shipowner to quash the service of summons. The shipowner contended that it was a foreign corporation organized and existing under the laws of California without property of any kind within the State of Oregon and without a principal office within the State of Oregon. As a matter of fact the shipowner's contention included a statement that it never had transacted any business within the state and did not, as well, maintain any agent, official or other person in the State of Oregon upon whom service of summons could be made. The sheriff of the county in Oregon in which the summons was issued made a return indicating that he had delivered the complaint and summons to H. H. Wrightson, manager of the defendant corporation. The defendant shipowner contended that Mr. Wrightson was in no sense its agent and for the reasons stated above as well, requested the court to quash the summons. A hearing was held before the court upon which evidence was introduced touching the business activities of the defendant as well as the relationship of Wrightson to such activities, and respective counsel argued their respective positions to the court.

This action is one brought under the Jones Act, and is a claim for damages for personal injuries which the plaintiff alleges he sustained while a member of the crew of one of the defendant's ships while such ship was anchored at Ulithia Island, Philippine Islands.

Wrightson testified that at the time of the service of summons upon him and for a few years beforehand, he had acted in the capacity of local manager of the Coastwise-Pacific Far East Lines. The telephone directory of the City of Portland listed the name of the defendant shipowner with an address and telephone number identical to that of Coastwise-Pacific Far East Lines. Considerable evidence was introduced relative to the number of voyages completed by the defendant to the Oregon port in question and it was clearly shown that the transportion usually originated in some port of the State of California. Wrightson actually handled the ships of the defendant shipowner, handling the arrangements for docking facilities, and generally looked after the husbanding of the vessel during the time that it was in the port. Wrightson also advanced funds to the master when needed and helped to secure added crew members whenever an emergency arose.

The court found that the defendant was engaged in interstate commerce and that as a foreign corporation could not be compelled to qualify to do business in the State of Oregon. In its decision these factors are minimized upon the ground that the shipowner was represented by an agent within the state. The court said that the action was transitory and therefore was immaterial where the cause of action arose or where the seaman was domiciled.

The shipowner presented many railroad cases in which service of summons had been quashed, where service was made upon passenger agents or representatives in states along the line, upon the ground that the railroad was not doing business within the state. The court distinguished the railroad cases upon the ground that no railroad line was running through the state even though a passengers agent was operating in it. Justice Cardozo's decision in *International Milling Company vs. Columbia Transportation Company* was cited by the court and great reliance placed upon its meaning in the decision of the instant case. Justice Cardozo in the *International Milling Company* case said:

> "The defendant, though an interstate carrier, does not do business like a railroad company along a changeless route. It is engaged in transportation in Minnesota as much as it is engaged in transportation anywhere. * * * At Duluth, a designated agent does whatever is necessary to facilitate the work of loading and unloading cargo * * * the carrier was not engaged in some incidental or collateral activity, such as the solicitation of freight to be carried at other times and places. It was engaged in the very act of transportation, the dominant aim of its corporate existence. * * * We find a situation where the defendant * * * brought its property into that state, not fortuitously or by rare accident, but in furtherance of a systematic course of business, and thereby subjected itself to suit. * * *"

The court reached the conclusion that the dominant position of the shipowner in this case was transportation. The court held that the defendant shipowner was doing business within the State of Oregon and therefore was subject to suit in the state by service of summons upon Mr. Wrightson as its agent.

Unfortunately this case, as so many others, is decided upon a question of fact. The legal questions involved have all been decided in accordance with the existing cases, however the court has seen fit to construe the activities of the shipowner in such a light that they amount to an activity within the state.

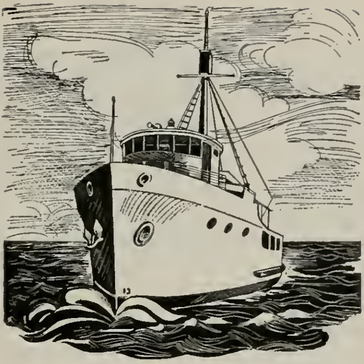
BOOK REVIEW

"SEAFOOD SHIPS"

A. C. Hardy, B.Sc., F.R.G.S., M. Inst. N.A., has just published a new book entitled "Seafood Ships." (London: Messrs. Crosby, Lockwood & Son, Limited, 20 Tudor Street, E. C. 4; full cloth; price 12s.6d. net).

In this story of world fishing, Mr. Hardy, whose books on maritime subjects are well known all over the world, describes, in 18 chapters, fish preservation, fishing grounds, the design and equipment of trawlers, trawler-drifters, seine netters, purse seiners, whalers and factory ships. There are over 100 plans and illustrations, while 16 pages in two colors show in profile every main fishing ship type throughout the world.

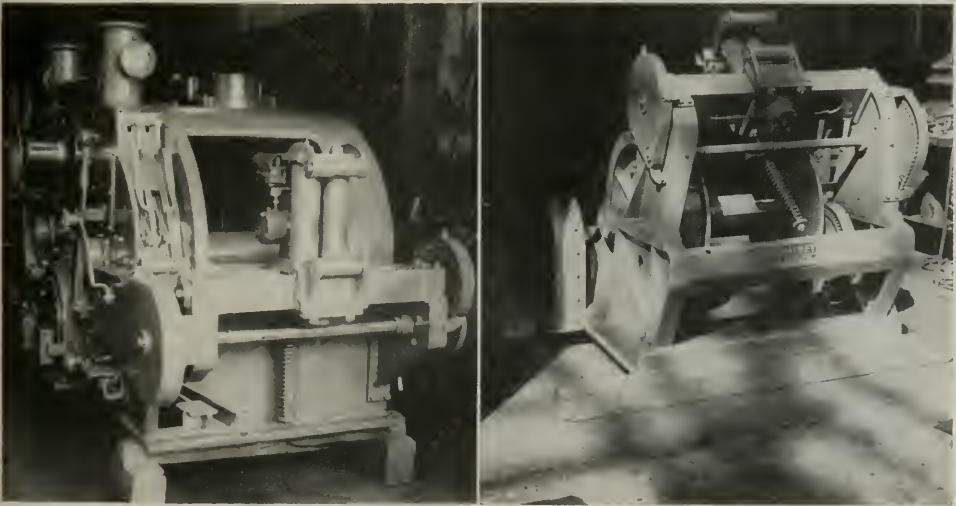
Coast COMMERCIAL CRAFT



SPECIAL EQUIPMENT ON PHILIPPINE EXPEDITION VESSELS

FITTED WITH SPECIAL EQUIPMENT, adapted to meet the particular requirements of the U. S. Fish and Wildlife Service on a scientific expedition of unique scope and significance, a former AMc-90 and an ex-LT-581, renamed the *Theodore N. Gill* and the *Spencer F. Baird,* sailed from California for a three-year stay in the Philippines. A thorough, scientific research job as to fishing methods, conditions, and opportunities in Philippine waters lies ahead of them.

In cooperation with the Philippine Government, the U. S. Fish and Wildlife Service of the Department of the Interior will aid in an extensive three year program of rehabilitation and development of the fisheries of the Island Commonwealth's war ravaged fishing industry. Hugh W. Terhune has been appointed the administrator of the program and will have his headquarters in Manila. The noted Seattle Naval Architect, H. C. Hanson, designed and engineered the conversion jobs on the two unique craft. The *Theodore N. Gill* was converted at the Fulton Shipyards, Antioch, California;



Below left, Markey Machinery Company of Seattle, type DMT-10 double drum trawl winch. Below right: Markey type DEV-3 sounding winch.

and the conversion work on the *Spencer F. Baird* was done in the yards of the Sausalito Shipbuilding Co., Sausalito, California.

The *Spencer F. Baird*, largest of the two research and exploratory vessels, has a steel hull, is 143 feet long, and has diesel-electric power, twin 900 hp General Motors engines driving the single screw. Originally built by the Levingston Shipbuilding Co., Orange, Texas, in 1944 for deep sea, long range Army towing, this craft not only has an exceptionally long fuel cruising radius but is possessed of accommodations that make her particularly suitable for the type of expedition planned in the Philippines. The towing gear, which dominated the vessel's war activities, has been removed and research laboratories and other scientific equipment have been installed.

Other special equipment includes: a type DMT-10 double drum trawling and fishing winch, and a type DEV-3, 7½ hp deep sea oceanographic winch, both of which were designed and built by the Markey Machinery Company, Seattle. The combination trawling and fishing winch has several special features. The gurdy, for example, has neoprene facing on it to protect the gear. There is a gypsy on either side of the winch for pursing. The winch is also equipped with double net-handling and hauling drums which can also be used for cargo handling. For scientific exploration at varying depths in Philippine fishing waters, the main drums on the trawl winch have been fitted with automatic cable laying and spooling ferries and equipped with measuring devices for determining the amount of cable in use at any given time. This super winch installation is driven by a 30-hp electric motor, mounted below deck, with controls at the winch.

The *Baird* is also equipped with a deep sea electric sounding winch of the type indicated above. This winch has an automatic fairlead for laying and spooling the cable and is also equipped with a counter to indicate the amount of cable laid out. It will handle 20,000 feet (6500 meters) of 5/32″ cable. Other special devices on this winch are a variable speed control and an accumulator for the rigging, both of which were installed to prevent damage to the delicate measuring, or sampling, equipment, motor and controls are mounted below deck, with the controls extended to the winch.

The Markey Machinery Company also designed and manufactured special equipment for the smaller of the two vessels, the *Theodore N. Gill*. This equipment includes a DMT-8 combination trawling and fishing winch, equipped with a neoprene-covered gurdy and gypsies on either side for pursing. Power for the winch is furnished from below deck by a 20-hp electric motor.

Officially a coastal minesweeper, in her war days, the *Gill* is a 97-foot, 450 hp Hamilton diesel, wooden vessel. It now has a seine turntable at the stern, for easy and efficient handling of nets, which has Markey hydraulic power roll drives.

WAR VETERAN TO BE CONVERTED TO LUXURY LINER

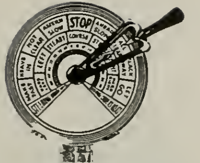
This photograph shows the MV Elpetal, 224-foot yacht recently purchased from a layup fleet by Norman Woolworth, on drydock at Bethlehem Steel Company's San Francisco Yard. Formerly the Carola, the Elpetal was sold to the Navy when the United States entered the War by its owner at that time, Frank Mandel, Chicago department store magnate. She was rechristened the USS Beaumont and with her rakish bow altered to semi-clipper, she saw service in the Pacific as a patrol craft.

Conversion of the vessel to its former status as a luxury yacht will take place at an Eastern shipyard, and it was Bethlehem's job to make the Elpetal shipshape for the voyage. This included drydocking, cleaning and painting the bottom, opening sea valves and pulling the tail shaft. Bethlehem also removed a number of Navy defense features from the craft, including the sound dome and ammunition locker and flooding valves.

The Elpetal, which has a beam of 34′6″, was built in 1937 in Kiel, Germany, for Charles F. McCann, an American businessman. She is powered with two 1100 horsepower Krupp diesel engines.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

THE ACCURACY OF AGETON'S METHOD IN CELESTIAL NAVIGATION

WHILE MOST MERCHANT MARINE navigators today employ the Hydrographic Office Publications No 214 or No. 218 in the solution of their celestial observations while doing their day's work, a considerable number of deck Officers prefer to use the Hydrographic Office Publication No. 211, commonly known as Ageton's tables. There are several reasons for this preference, including the fact that when using HO 214 either the navigator or the vessel must be provided with a library of at least six or seven large and rather unwieldly volumes. Their very size and weight acts to discourage the navigator from carrying them around as personal possessions, and not all vessels are provided with complete sets of HO 214. Ageton's tables are all contained in one small volume that would almost fit into a pocket, and to many Deck Officers the convenience of carrying them from ship to ship outweighs the fact that it takes slightly longer to work out a line of position using them than it does using HO 214. In addition to this convenience, many of our practicing marine navigators were trained during the war in the U. S. Maritime Service Training Schools where Ageton's tables were the standard used for teaching navigation, and for one reason or another dislike to change from the way that they were taught. The above reasons, together with the simplicity of the tables, combine to make Ageton's method enjoy considerable popularity aboard ship. In using the tables, however, under certain conditions the unwary navigator's computations may be as much as 30 miles in error!

Ageton's tables were first published by the Hydrographic Office in 1931. In using these tables the navigator calculates the altitude and azimuth of an astronomical body as they would have been observed had he been at the position indicated by his dead-reckoning. Then, following the procedure attributed to Marcq Saint Hilaire, he draws a line on his chart through this position directed to the proper azimuth, moves his position along the line by an amount equal to the difference between the computed altitude and that actually observed, and through the point thus found draws his "line of position" at right angles to the azimuth line.

The tables utilize the division of the astronomical triangle into two right spherical triangles. The use of the log cosecant and log secant to avoid the confusion of characteristic and decimal point in the logarithms, and their designation, for simplicity, by the letters A and B, together with Ageton's ingenious arrangement of the calculations according to a standard form with simple, uniform rules, accounts in good measure for the popularity of the tables. Then, too, the calculations and the plotting are based on the dead reckoning position, as in the original Marcq Saint Hilaire procedure, and navigators have for the most part been reluctant to use assumed positions.

The tabulation of the logarithmic quantities at intervals of five-tenths of a minute, however, has led to the belief that interpolation is unnecessary. In this connection, HO 211 makes two statements:

"This table gives an accuracy of solution to within

(Dr. Samuel Herrick, Executive Secretary of the Institute of Navigation and Professor of Astronomy at the University of California at Los Angeles, recently included in an astronomical paper a commentary on the accuracy of Ageton's tables. It is with his kind permission that "The Skipper" includes in this column much of the reasonings and conclusions of Dr. Herrick.)

five-tenths of a minute in altitude and an average error of only two-tenths of a minute without interpolation. The navigator who wishes greater accuracy should interpolate between tabulated functions". (Page 6)

"Caution. When the hour angle approaches 90°, a significant error of one or two miles may occur when computing the altitude of celestial bodies. It is a good plan to discard those sights where the value of K is found to lie between the limits of 87° 30′ and 92° 30′." (Facing title page)

One may reasonably infer from these statements that the error in an altitude calculated *without interpolation* will certainly be less than half a minute of arc, except for a specified range (in which the local hour angle as well as the quantity K approaches 90°), the maximum possible error then being one or two minutes. Actually, the maximum error, when interpolation is neglected, is about 6′ or 6 miles outside of the forbidden range, 30 miles within it.

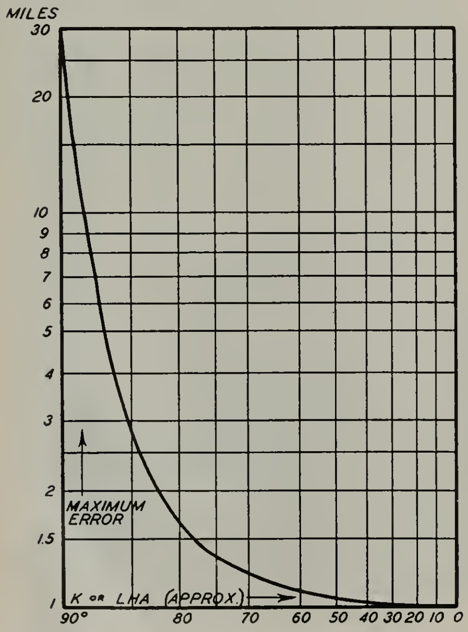
Figure 1 is a plot of the maximum errors indicated by numerical examples. Both the error scale and the K scale are logarithmic in order to expand the area of the graph in which the error becomes critical; it will be noted also that the least of the maximum errors, on the bottom line, is one mile, not zero. The horizontal argument may be taken as the local hour angle (LHA) especially when the declination (d) is in the neighborhood of 54°, but the approximateness of this subsituation is indicated by the fact that when K=87½°, LHA varies from 80° 37′ for d=75° to 89° 47′ for d=10°.

The most important source of the large errors indicated by Figure 1 is in the determination of log sec R from log cosec R. (These quantities, designated B and A by Ageton, are found in the third line of his well-known calculation form; R is the arc of a great circle from the observed body to the meridian, to which it is perpendicular, and is common to the two right triangles into which the astronomical triangle is divided.) The practical result of not interpolating in this step is shown graphically by Figure 2, which was prepared under the supervision of Commander W. S. Mayer, Jr., Department of Seamanship and Navigation, United States Naval Academy, when the size of the maximum error had been called to his attention. The graph is based upon calculations of altitudes for constant latitude (30° N.) and declination (46° N.) and for varying local hour angles in the critical region near 90°. The solid line represents values computed by Ageton's tables without interpolation; the dashed line indicates approximately the true values. The behavior of the graph of altitudes computed by HO 211 is occasioned by the fact that log cosec LHA=A(LHA) and log cosec R=A(R)=A(LHA)+B(d) do not change sufficiently with the changing LHA to alter the value of log cosec R=B(R) when it is obtained from A(R) without interpolation, except at those points where the line takes a downward step. The periodic discrepancy between Ageton's tables and the correct value is clearly shown. It is due, in the last analysis, to the use of the same set of trigonometric formulae to solve for angles near 90° as for those near zero.

The following examples, in which the stated large errors are found, may be of interest:

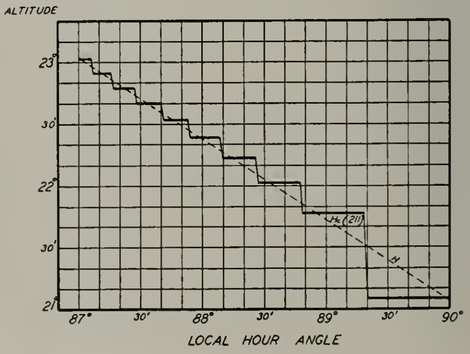
EXAMPLE A: LHA=87° 16′.0 W., d=45° 52′.0 N.,

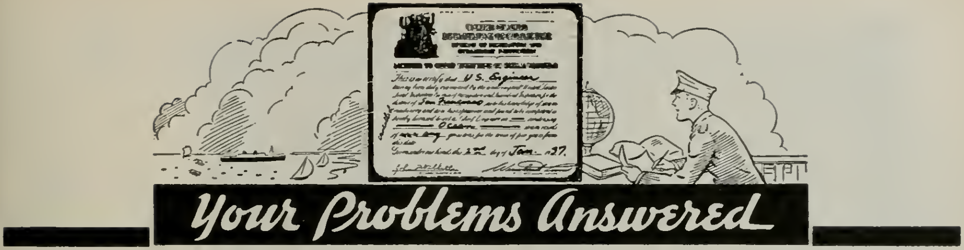
(Please turn to page 96)



◄ Figure 1. The maximum error (minutes of arc or nautical miles) resulting from the calculation of altitudes, without interpolation, from Ageton's tables, HO 211.

▼ Figure 2. Altitudes calculated for latitude 30° N., declination 46° N., and the indicated local hour angles. Dashed line (H) represents the correct values; zigzag line, the values calculated by Ageton's tables.





by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

APPLIED MATHEMATICS FOR MARINE ENGINEERS

Longitudinal vs Circumferential Stress in Pressure Shell

Question:

A YOUNG ASSISTANT ENGINEER asked me to explain the "ratio between the longitudinal stress and the circumferential stress in a boiler shell." He said that he had been given that question in an examination and had to pass it up. He had always thought that the stresses in the plating of the shell were the same in all directions, but he admitted that all the circumferential riveted joints he had seen were not nearly as strong as the longitudinal joints. So here it is, and an excellent example of applied mathematics.

"The Chief"

Answer:

First we must discuss the meaning of "ratio." It really is simply a fraction. See the blackboard sketch No. 1 herewith. Note that the common misunderstanding about ratios is all the different algebraic signs or shorthand used in books and printing. In the early days printers had great trouble setting in type the fraction sign or division ÷, so they used a colon : and for the equals sign they used two colons thus, :: . We have all these different ways to express a ratio or a fraction. When two ratios or fractions are equal to each other as 2 4 equals ½ we then have a proportion, or simply an equation. And finally if we want the ratio of two quantities we simply divide one by the other. Of course, they both must be quantities of the same things, as miles or hours, etc. If they are of different things as miles *and* hours, then the ratio is more than a number but has a meaning, such as speed or velocity in this case.

Now if we want the ratio of two stresses in the boiler shell we must figure the stress in each case and divide one by the other. We can save ourselves a lot of time and trouble if we know our algebra (and can trust ourselves with it). Because we need only set down the formula for the two stresses and divide. We must be sure the units are correct and that we use inches, pounds, etc., in both cases, and be sure the symbols and letters mean the same in both formulas. To determine which to divide by the other, be sure of the question. Example: if it is to find ratio of A to B, then divide A by B. But if it is to find ratio of B to A, then divide B by A. In either case one is the *reciprocal* of the other and if you have divided the wrong way, do not divide again, instead divide unity or one by the answer you had and you will have the correct answer.

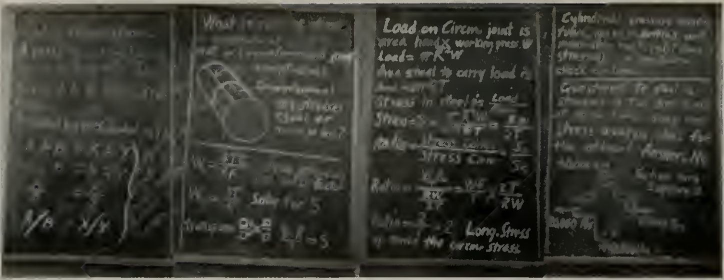
Now to the problem. As shown in blackboard sketch No. 2, we obtain the formula for stress in the longitudinal seam from the formula for W, the *allowable working pressure.* This is done by transposition in which, by the rules of algebra, we may move a letter from one side of the equals sign to the other, if we at the same time move it to the other side of the fraction mark. We also drop the terms for factor of safety (F) and efficiency of the joint (E), as these are not involved in a study of stresses.

In these sketches the letters have the same meaning as in the Coast Guard Marine Engineering Regulations. They are:

W is pressure psi (pounds per square inch).

R is radius of the boiler shell in inches.

T is thickness of the plate in inches.



Blackboard illustrations, Figs. 1 to 4, referred to in this article, on page 81.

S is stress in the steel of the plate in psi.

Note: In solving for W, we give S a figure of 50,000 psi, but in this case we are solving for this stress S when the W psi is given.

We now have to set up the formula that expresses the stress in the steel due to the pull of the load on the ends or drums. This stress is along the axis of the boiler shell and tends to pull apart the circumferential joints. As indicated in the third blackboard sketch, the stress is the load on the steel divided by the area of the steel that resists this load. This is a fundamental definition of stress which, therefore, is in itself a ratio having a meaning. Obviously the load is the area of the drum or head times the W psi. The steel area is the circumference of the shell times the plate thickness T. Notice how this stress ratio is 2. The ratio of the longitudinal joint stress to that of the circumferential joint is 2, or twice, or two to one, or double. This, then, explains why on page 68 of the Regulations, (quoting in part, paragraph 52. 3-5)

> "(a) The minimum strength of circumferential joints attaching shells to heads of boilers or other pressure vessels shall bear the following ratios to that required for the longitudinal joints of the shell:
>
> Fifty per cent when no part of the load is supported by either tubes or stays.
>
> Forty per cent when one-half of the load on the head is sustained by tubes or stays . . . . etc.
>
> (b) The strength of the circumferential joints connecting courses of the shell shall be not less than 75 per cent of that of the longitudinal joints . . . . etc."

Note: The 50 per cent is satisfactory because the stress is one-half, but an additional allowance is required if the joint connects courses in the shell. There is an empirical allowance based on practice and safety, not on pure theory. It allows for additional stress due to the weight of the boiler and its water, which is frequently carried on the two ends of the drum, causing it to act as a beam which puts additional stress in the bottom parts of the circumferential joints. Temperature expansion and other factors may cause stress which experience has shown must be allowed for in these joints, which accounts for this empirical increase of strength of 50 per cent.

It is now obvious that the steel in the boiler shell is stressed in two directions, longitudinally and circumferentially, and these stresses are tension. There is also a radial compression stress which forces the inner skin of the shell outwardly so that the entire thickness of the steel helps to carry the tension. It is interesting to note that a stress in one direction does not affect the ability of the steel to carry a stress in another direction at right angles to the first. See the fourth blackboard sketch. As shown in the figure, the right angle stresses in tension do not interfere with each other. The steel is just as strong vertically whether or not the horizontal stress is there. The only difference is that the elongation under the vertical stress will be less if the horizontal is there in tension. And it will be more if the horizontal stress is there in compression. This can be visualized if one will imagine the material is rubber instead of steel. In fact, there is some evidence to the effect that with the right angle stress the steel will withstand more load than if only one stress exists.

Our next article will discuss the application of mathematics to the regulations governing the design of the head or drum of the boiler shell.

BLUE WATER NAVIGATION by Svend T. Simonsen, published by Cornell Maritime Press, New York. Price $3.50.

This book gives a simple, streamlined course of instruction in modern practical celestial navigation, intended for the small boat owner who looks forward to blue water cruising and the days when the adventure of a long voyage in a small boat will again be possible.

The use of an inexpensive artificial horizon is explained so that a reader living far inland can study and practice navigation right at home. The many illustrations and sample problems are simply and logically arranged to fit into the text. The student can easily follow the step-by-step procedures required to work navigation problems by tables H. O. 211, and 214, using the Air Almanac or the Nautical Almanac.

On the Ways

New Construction - Reconditioning - Repairs

ARMY CABLE SHIP OVERHAULED BY TODD

Army Cable Ship, General Samuel M. Mills

The semi-annual reconditioning of the 1400 ton, U. S. Army Cable Ship *General Samuel M. Mills* at Todd's Hoboken Division, included bottom, exterior, and deck painting, inspection and overhaul of all working machinery below decks; relining and repairing shafts, and miscellaneous repairs to bulkheads, hull plates and other pieces of equipment. The job, including drydocking, took about four months.

The *General Mills* was originally built as a minelayer at Point Pleasant, West Virginia, in 1942, and saw wartime service as such in the First Army Coastal waters district, which extends from Maine to Delaware. For a while, she served in the dual capacity of laying cables between islands, Army posts and harbors for the Army communication systems.

Last year, when cable-laying and repairing work became heavy, the vessel was converted to a full-time cable-layer, by the addition of a cable reel and king post at the bow and other structural changes, which conversion was also performed by Todd under contract with the Army.

The vessel carries a crew of six warrant officers of the Army Mine-planter Service, who are all licensed ships' personnel, and 40 Army enlisted men, half of them are in the technician grades and all of them are experienced seamen. There are also four Signal Corps civilian submarine cable specialists on board. The activities of the cable ship are directed by Colonel Grant Williams, Signal Officer, First Army. The maintenance and repair of the vessel is handled by the Transportation Corps.

NEW TYPE TRANSPORT AT TODDS

The transport *William H. Thomas* (ex-*Rixie*), first of a new type of Army transports, went into service August 15, carrying military and Army civilian passengers to Hawaii.

Constructed during the war by the Moore Dry Dock Company in Oakland as a naval hospital ship, the *Thomas* has been converted by the Army Transportation Corps to meet its peacetime requirements. The conversion was accomplished at the Todd Shipyards at Seattle, where

▲

This is the USAT William H. Thomas, newest Army transport, now anchored at Oakland Army Base, preparing for her maiden voyage to Honolulu and return. Named for Private First Class William H. Thomas, Congressional Medal of Honor winner in World War II, the Thomas is especially designed to handle the peacetime movement of Army families to and from oversea bases.

▼

two sister ships, the *Mower* and the *Johnson,* are also being readied for similar work.

Basic features of the conversion are the exceptional amount of cabin space provided to meet the Army's needs for carrying families of military and War Department employees and the special accommodations afforded for the comfort and convenience of all passengers. The *Thomas* has 184 cabin spaces as compared to 142 on the P-2 (Admiral) class, the Transportation Corps' largest troopships. She has quarters also for 474 persons in the troop sections.

The design throughout is comfortable and commodious. Most cabins have four berths with attached baths. The troop compartments are limited to three deep berthings, as compared to wartime five deep, and the largest holds only 117 passengers. All passenger compartments and cabins are on C deck or above.

The *Thomas* has a large troop recreation room, a special covered deck, troop recreation area with benches, a nursery, an enclosed open air play space aft of the main housing, a large lounge, a smoking room, and other installations not found on wartime troopships.

The new transport is a C-2 type vessel 459 feet long, of approximately 8600 tons dw, with 63 foot beam. She is propelled by turbines and has a cruising radius of 16,200 miles. Her top speed, when the engines are broken in, will be 19 knots but she probably will cruise at 17 to 18. She carries a crew of 128.

The *Thomas* is named for Private First Class William H. Thomas, a Sheboygan, Wisconsin doughboy who gave his life to protect his comrades of a 38th Infantry Division platoon in the fighting on Luzon and who was awarded the Congressional Medal of Honor posthumously.

BACK TO THE BRINE

The old auto ferry, *City of San Rafael,* which has just recently undergone drydocking and miscellaneous engine room and superstructure repairs at Bethlehem Steel Company's Alameda Repair Yard, soon will be a familiar sight again on the Benicia-Martinez run. Bay Area residents may recall the severe storm, late in 1942, which caused the *City of San Rafael* to break loose from her mooring at Richmond and run aground far up on the beach at Winehaven.

This ferry, which has a capacity of 50 autos, 600 passengers and a gross weight of 484 tons, has a wooden hull and is equipped with horizontal reciprocating engines. It was built at the Alameda Yard of James Robertson in 1924, and was operated by the Richmond-San Rafael auto ferry from that year until 1942.

The *City of San Rafael* was blown so far up on the beach in that year's storm that her underwriters gave her up as a complete loss and she was sold for salvage. In 1943, the U. S. Government, intending to use the boat to ferry civilian personnel from Martinez to Benicia for the Army, ordered salvage operations stopped. A Richmond contractor was hired to float the vessel and make the necessary repairs to put her in proper operating condition.

A channel had to be dredged from the bay right up to the ferry before she could be re-floated, but she was finally repaired and delivered to the Martinez-Benicia Ferry in December of 1943.

SOCONY-VACUUM'S YACHTING CHARTS

Offering yachtsmen accurate information about coastal and inland waters of the United States, a new series of cruising guides has been prepared by Socony-Vacuum Oil Company, Inc., for distribution through the company's Mobilgas-Mobiloil marine dealers and its marine sales department at 26 Broadway, New York.

Six of the guides, which were ready in June are to be followed in several months by four additional guides. All are in four colors and are being made for Socony-Vacuum by Rand McNally and Company.

The guides have been designed to make it as easy as possible for the yachtsman to plan his cruises. The maps show the locations of light houses, buoys, important yacht clubs and Coast Guard Stations. The coastline is depicted in detail, with large inland cities as well as coastal cities being indicated. Other aids to navigation include the true compass course and distances between popular cruise harbors.

At left: The above photo, taken in June of 1943, shows the City of San Rafael on the beach at Winehaven where she was blown by the severe storm.
At right: This photo shows special staging erected by Bethlehem Steel Company's Alameda Repair Yard before performing repairs to the City of San Rafael's superstructure.

Running Lights

Edited by B. H. BOYNTON

PRESIDENT PEOPLE

Left to Right: Arthur B. Poole, vice president in charge of Finance, Michael J. Buckley, vice president in charge of Freight Traffic, George Killion, newly elected president and E. Russell Lutz, executive vice president; all of American President Lines.

Murrison C. Wright is in charge of the West Coast Engine & Equipment Co. of Oakland, which represent Detroit Diesel Division of General Motors Corp.

Repair shop of West Coast Engineer and Equipment Co. At right is Gene Rhea, in charge of GM diesel service.

WEST COAST ENGINE AND EQUIPMENT CO. HANDLES G. M.

The West Coast Engine & Equipment Co. of Oakland, California, represents Detroit Diesel Division of General Motors in the coastal counties of Northern California from San Luis Obispo County to the Oregon State line. Both marine and industrial engines are included in the franchise.

Murrison C. Wright is in charge of the operation and has been in the Diesel engine industry for 20 years, mostly with the original Atlas Imperial organization. He managed the Atlas branch in Seattle, managed Atlas factory in Mattoon, Illinois and was sales manager in Chicago. More recently he has been with GM as Marine Sales Representative and Installation Engineer on the Pacific Coast. He left that position July 1, to organize this new company.

James R. Williams is in charge of Sales and was formerly with GM as West Coast Sales Representative in which capacity he supervised the activities of the various Detroit Diesel distributors on the Pacific Coast. He has been with GM since 1940 and has joined the newly formed West Coast Engine & Equipment Co.

Gene Rhea has been in charge of GM diesel service on the Pacific Coast for the last four years and is considered outstanding in his field. Before the war he had charge of General Motors Automotive Service shops and is thoroughly familiar with high speed automotive service practices. This will permit engine overhaul jobs at the least cost to the customer.

The present site of the operation is the office building of the old Standard Gas Engine Co. General Motors already has many engines in the territory and West Coast Engine & Equipment assumes a heavy responsibility in contracting to furnish adequate parts and service facilities for the large number of GM diesels already operating in Northern California.

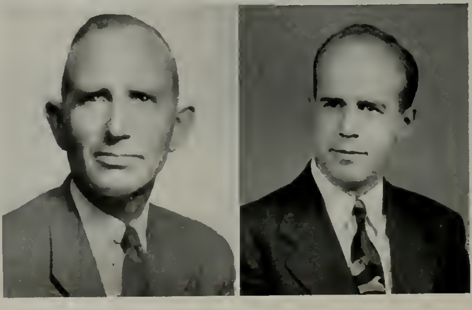
West Coast Changes by Detroit Diesel

Two new appointments to West Coast sales positions were announced recently by V. C. Genn, general sales manager of the Detroit Diesel Engine Division, General Motors Corporation.

Lauren H. Wells has been assigned as sales engineer for the northern West Coast zone and will direct industrial, marine and petroleum distributors sales in that area. His territory will include Washington, Oregon and the northern part of Idaho.

Victor Hansen will take over the southern West Coast zone in a similar capacity with distributors in California, Arizona, and eastern Nevada coming under his jurisdiction.

The appointments of Wells and Hansen were made to fill vacancies left by Murrison C. Wright and James R. Williams who, as of August 1, take over the northern California distributorship franchise for the sale of GM Series 71 Marine and Industrial diesel engines.



Left to right: V. Hansen and L. H. Wells of Detroit Diesel Engine Company.

▲ Ed L. Ryan of Gladding McBean & Co., Refractories Division, who carries on his marine business by air, up and down the coast. ▼

Ed L. Ryan—Master of Sea and Air

It is not often that we have the pleasure of working up a story on a holder of both unlimited master's license and a commercial pilot's license!

Although in Southern California marine circles no introduction is necessary, we present Ed L. Ryan, Los Angeles Harbor Area dealer for Gladding McBean & Co.'s refractories division.

Ed Ryan, who also represents U. S. Gaskets and Coen oil burner parts, and who has lived in the Los Angeles Harbor Area for 25 years, has been flying for a quarter of a century! During World War I he served in the Navy, and was gunners mate on the dreadnaught *South Carolina;* also was on destroyer *Hart.* His Navy hitch was in both Asiatic and Atlantic waters.

Ryan has had his unlimited masters license for over 20 years; and holds a commercial pilots license as well. His first sea-going service was with the U. S. Army Transport *Edgemore* and others. He joined The Texas Company in 1926, sailing out of Los Angeles Harbor on tankers *California* and *Galena.* He was advanced to be First Mate of the tanker *New Jersey,* and he also served on tankers of the "Cal-Pet" fleet. He was Master of the *Pasadena,* owned by Western Ship Service Company.

Mr. Ryan came ashore in 1930 and went with Plant Rubber & Asbestos Works. In 1935 he opened his own business at Wilmington, California, specializing in marine firebrick and high pressure boiler gaskets and Gladding McBean marine refractories. He carries a complete stock to meet any marine refractory requirement on instant notice.

Ed Ryan flies his own plane to any port on the West Coast, and, we all agree, this is giving rapid service!

The Annual Meeting of the
Society for Experimental
Stress Analysis
will be held at
The Hotel Pennsylvania,
New York, N. Y.
on
December 4, 5, 6, 1947
Inquiries should be addressed to the Society for Experimental Stress Analysis, P. O. Box 168, Cambridge 39, Massachusetts.

Charles T. McClellan Appointed by Radiomarine

Appointment of Charles T. McClellan as West Coast Sales Representative of Radiomarine Corporation of America, with headquarters George F. Shecklen, executive vice president.

Prior to six years of active duty as a Navy staff communication officer in the South Pacific, Mr. McClellan formerly was deputy general manager of the Radio Corporation of the Philippines and later held the post of Mackay Radio's China representative for eight years.

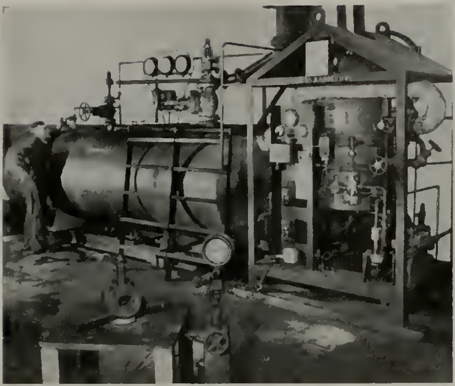
During his six years of active duty in the U. S. Navy, Commander McClellan was Officer-in-Charge of shore radio installations in the South Pacific Area, member of the Naval in San Francisco, was announced by Technical Mission to Japan and Officer-in-Charge of the joint communication center at Kwajalein during the Navy's atomic bomb tests.

Charles T. McClellan, West Coast Sales Representative of Radiomarine Corporation.

Enterprise Appointment

The Enterprise Engine Company, Inc., announces the appointment of C. G. Smith as manager of its New York Office at 44 Wall Street, New York City.

Herbert Anderson, who has been with the Enterprise organization for a number of years, will continue in his position as assistant district manager of the New York Office.



The Besler flash boiler installed in the Thomas A. Short shop, offers the trade the most extensive facilities for the repair and testing of safety valves on this Coast.

REPAIR AND TESTING OF SAFETY VALVES

Extensive Facilities at Thomas A. Short Co.

The Thomas A. Short Co. have installed in their shop the most extensive facilities for the repair and testing of safety valves on the Pacific Coast.

The primary equipment consists of a Besler flash boiler with a pressure range up to 2000 pounds psi and 950° of superheat. This boiler is used in conjunction with a large receiver or accumulator. The receiver is built for a pressure of 600 pounds psi at 750° temperature. At saturated temperatures pressures of 650 pounds can be used. An eight inch exhaust pipe is run to a large muffler on the roof. This was found necessary to kill some of the blast resulting when large valves were popped at pressure up to 500 and 600 pounds. Two inch and four inch valves are mounted on the receiver and various adapters are made to accommodate the different types of valves. During the test, if a safety valve fails to function properly it is only necessary to close the valve on the receiver and necessary adjustments on the safety valve can be started in a comparatively few minutes. This is a far cry from the days when valves were repaired and installed directly on the boiler. Then in case of a valve not functioning properly, it was necessary to blow down the boiler with a resultant loss of time up to 24 hours.

Safety valves received for repairs are opened, stems are checked for true, spring washer ball joints checked for true, seats are blanked off and given a hydrostatic test to insure tightness in the body of the valve. Feathers are checked against factory gages and brought back to original factory specifications. Bodies of valve are examined visually and if any corrosion is evident the whole body is blanked off and given a hydrostatic test. Adjusting rings are freed if necessary, and the alignment of all parts carefully checked. Even after the above steps have been carefully taken, it is frequently found that the valve does not work properly when tested with steam and it is necessary to alter different dimensions of the valve so that proper results are obtained. Finally, when the valve is completed, it is guaranteed to function properly and be tight.

Valves shipped in to the Thomas A. Short Co. from any place on the Pacific Coast will receive their immediate attention and normally can be overhauled and tested on a 24 hour basis.

The Thomas A. Short Co. engineers recommend three suggestions for operators in regard to safety valves:

1. When coming in for inspection, test safety valves before securing the plant. Then if repairs are required, sufficient time will be available.
2. Examine the interior of valves periodically. Valves only a few years old have been found dangerously corroded.
3. Let only qualified shops make your repairs. Many valves come in for repairs with the feathers and seats completely ruined by inexperienced people working on them resulting in costly replacement of parts.

RUDY De GOROG LEAVES MATSON

After many years as Superintendent of the Catering Department of Matson Navigation Company, Rudolph DeGorog resigned, last May, to enter other business.

He was succeeded by P. F. Cannon who has served for the past eight years as Assistant Superintendent. Mr. Cannon joined the company in 1931, serving in various capacities in the Stewards Department aboard the passenger ships, and later coming ashore as a member of the catering staff.

ERRATA

In the General Electric Company's ad on page 11 the statement is made that an installation on the SS. URUGUAY was made by the General Electric Service Shop. This installation was actually made by Federal Shipbuilding and Drydock Co.

WEST COAST FACILITIES OF GARLOCK PACKING CO.

The Garlock Packing Company, manufacturers of mechanical packings, gaskets, oil seals and molded rubber goods, now in its 60th year, has maintained a west coast sales office and warehouse in San Francisco since 1905.

Operating under the direction of a district sales manager with headquarters in the Garlock building at 930 Bryant Street, Garlock representatives call regularly on the west coast marine trade in the San Francisco area and north to the Canadian border and on all industrial operations in northern California, Washington, Oregon, and the western portions of Idaho and Nevada and in Alaska and Hawaii. Garlock warehouses are also maintained in Portland, Seattle and Spokane for serving customers in the Pacific Northwest.

Southern California is supplied with the firm's products from the Los Angeles branch located at 2303 East 8th Street, also in charge of a district sales manager, with representatives covering all marine and industrial operations in southern California and Arizona.

In addition to its domestic operations the San Francisco office of the company handles a substantial export business. The firm's products are distributed through that office to Australia, China, Dutch East Indies, India, New Zealand and the Philippines.

The products manufactured by this company are greatly diversified and highly specialized. To serve properly this west coast area requires more than forty specially trained employees.

Scenes in San Francisco of office and factory of Garlock Packing Co. Upper right is E. A. Tolley, district manager. Center right is Herbert F. Buckley, marine representative. Busy at the bench cutting gaskets is Matt Quick, who has put in many a year of good service with the company. The secretary in the lower center picture is Miss Helen Lumb.

At left: C-O-Two fire extinguishing equipment, on the left is Milton Schug, general manager in Southern California with Louis Ets-Hokin. Above: Liquidometer display by E. H. & G. at a recent Marine Exposition shows a panel of various gages and indicators which E. H. & G. are California distributors.

ETS-HOKIN AND GALVAN-ELECTRICIANS

"Everything electrical for Shipboard" is the slogan of Ets-Hokin & Galvan, successful general electrical contractors dealing in marine, industrial and commercial equipment, who started out in 1920 as a two-man outfit, installing electric systems on boats. Now Louis Ets-Hokin heads the firm, with two main establishments, one in San Francisco, and one in Wilmington, with branches in Monterey, Stockton, Newport Beach, San Diego, and Oakland. Newport is their most recent, and their "glamour stores," serving primarily the yacht trade. Mr. Galvan retired from the business in 1945.

C-O-Two Fire Equipment

C-O-Two Fire Equipment Company of Newark, New Jersey, is represented in California by E. H. & G. In the above photograph is shown the C.O-Two smoke detecting system which provides a means of detecting smoke automatically in any hold, an arrangement for visual indication of the exact location of the threatened space and an alarm to give audible warning the instant smoke appears. With the smoke detecting system, there is often combined a fire extinguishing system using carbon dioxide. Ets-Hokin and Galvan install and maintain this equipment.

G. H. & G. Line of Radiotelephones

Ets-Hokin and Galvan are not only distributors but designers of radiotelephones and modern lighting installations, fluorescent and incandescent. The new 100 watt radiotelephone for the larger fishing craft was designed by Maurice Antoine, electronics engineer of E. H. & G., (who is in charge of G. E. Radar installations), and gives direct communication from deep sea and tuna boat operations with the shoreside offices.

Kirsten Photo-Pilot and Sol-E-Naud

The Kirsten Photo-Pilot and Sol-E-Naud for automatic pilot for steering on pleasure boats and commercial craft is distributed by E. H. & G. The Photo-Electric pilot is composed of an electric motor for power unit, which obtains its current from the main engine starting batteries. It is connected to the steering wheel by roller chain gears or cables, or to some other point in the steering system by suitable means. The motor is engaged and disengaged by an electrically or mechanically operated clutch. The binnacle unit (the brain of the automatic pilot) directs the motor in turning the rudder so as to hold the course. The pilothouse control is a switch to connect the pilot to the electric power supply and to energize the clutch. The pilot will hold any preset course with a variation of less than can be held by an experienced helmsman under any weather condition, without attention; but it will, of course, not take the place of a lookout or avoid floating logs and other craft by itself.

Liquidometer

The fuel and water supply in pleasure boat can be a cause of anxiety to the operator if he has no sure knowledge of its sufficiency. Ets-Hokin & Galvan have an answer to this problem in the distribution to the California trade of the Liquidometer Corp. line of gages. They can provide direct reading at the tank; electrically operated remote reading types; air operated remote reading types; or the balanced hydraulic type which requires no outside power to operate. E. H. & G. is also handling other Liquidometer products, such as rudder angle indicators and position indicators (as shown in the illustration on page 86). The latter instrument gives a remote reading of the position of valves or levers anywhere on the ship.

General Electric Electronic Navigator

The Pope and Talbot *Seafarer* was the first large West Coast ship to be equipped with General Electric radar, or "Electronic Navigator." The installation was made by Ets-Hokin & Galvan, who are California distributors for the device. Another more recent installation by E. H. & G. of this radar equipment was on the *Sparrows Point,* Richfield Oil Company new T-3 tanker.

Other Lines Represented in California

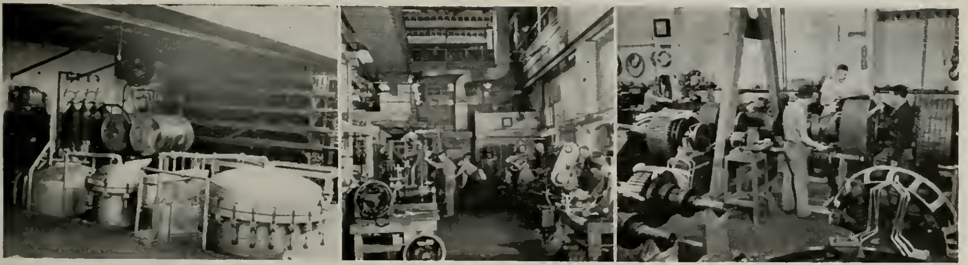
This marine electrical firm also handles the following lines, many of which are the world's best: The Carlisle & Finch Company, searchlights; The Electric Storage Battery Co., Exide batteries for marine use; The Hartman Electric Mfg. Co., automatic switches; Hose-McCann Telephone Co., Inc., sound powered telephones; Kohler Company, automatic electric plants; Lovell-Dressel Co., Inc., marine electrical fixtures and appliances; National Electric Products Corp., shipboard cable only; Pyrene Manufacturing Co., Pyrene fire protection products; Stewart-Warner Corporation, marine instruments; The Portable Light Co., Inc., searchlights and marine horns; The Safety Car Heating and Lighting Co., Inc., voltage and current regulators, and Crocker-Wheeler Electric Mfg. Co., motors and generators.

Repair Facilities

There are three important features in the Ets-Hokin and Galvan motor repair facilities: (1) spray welding; (2) dynamic balancing; (3) vacuum impregnation, which is the coating of marine motors with varnish for insulation. This process is carried out in a set of vacuum tanks, and is done at Wilmington and San Francisco—although the Wilmington shop has the largest equipment.

At top: Maurine Antoine, electronics engineer and designer of the newest Ets-Hokin and Galvan radiotelephone.

At bottom: William Rogers, purchasing agent of Ets-Hokin and Galvan in San Francisco.



Shop facilities for repair of electric motors.

▼

Captain Malcolm E. Crossman, USMS, superintendent of U. S. Maritime Service Training Station in Alameda, California.

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MARITIME TRAINING STATION AT ALAMEDA EXPANDS PEACETIME PROGRAM

The opportunity for all Licensed and Unlicensed Merchant Seamen to receive training in the Deck, Engine or Steward's Department, which enabled thousands of men to advance themselves and the efficiency of their ships during the war, is being continued on a peacetime basis by the Training Division of the U. S. Maritime Commission at the U. S. Maritime Service Training Station, Alameda, California.

The objective of this program is to provide the operating personnel of the Merchant Marine with a course of instruction which will bring him abreast of current developments in the industry, and improve his professional qualifications. The following courses are immediately available at the Training Station:

FOR LICENSED OFFICERS

Marine Steam Engineering
Marine Electricity
Marine Refrigeration
Machine Shop Practice (60 hours)
Marine Diesel Engineering
Advanced Navigation
Advanced Steamship and Cargo Stowage
Loran and Radar training

FOR UNLICENSED SEAMEN

Marine Steam Engineering
Marine Electricity
Marine Refrigeration
Machine Shop Practice (60 hours)
Chief Steward's Training
Cooking, Baking and Butchering
(Separate course)
Practical Seamanship

All of the above courses, with the exception of Marine Electricity, are of 30 days duration. The Electricity course is for 60 days.

Quarters and subsistence are available at the Station for all men taking a course of training. Licensed officers are paid while in training at the rate of $150 per month, and Unlicensed seamen at the rate of $100 per month. This pay is uniform, regardless of course taken or Maritime Service rank or rating held. Laboratory, classroom, or shop uniforms are furnished, and complete recreation facilities are available on the station to all students.

Enrollments are weekly, every two weeks, or monthly, depending upon the course being taken. Eligibility requirements have been so designed as to provide for the largest number of qualified Merchant Seamen possible. While these requirements vary slightly depending upon the course of training being taken, in general it is required that proof be presented of having served a minimum of 8 months sea service in the Merchant Marine during the 12 month period prior to enrollment, together with signing a statement certifying the applicant's intention to continue shipping in his respective department for a period of one year following completion of training. Physical examinations will be for the record only, except that an active communicable disease will be disqualifying.

In addition to the above, Loran and Radar Training will be available to qualied Deck Officers, on a no-pay basis. This course of training will be of one week duration for Loran and one week for Radar, with enrollments weekly.

Complete details on the program's courses are available at the U. S. Maritime Service Enrolling Office, 1000 Geary Street, San Francisco. Licensed and Unlicensed Merchant Seamen are urged to apply immediately to take advantage of these training opportunities.

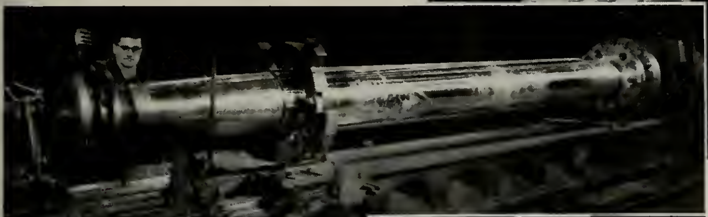
ELECTRONICS CONSULTANT SERVICE

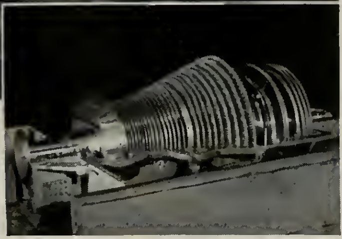
Charles W. Chattin has announced the opening of a new marine electronic business under the firm name of Marine Electronic Engineers at 22 Front Street, San Francisco. Consulting service, and complete maintenance and repair services for all types of marine electronic equipment including radar and loran are offered.

Mr. Chattin is a Lieutenant Commander in the Naval Reserve and has received advanced training in electronics from Harvard and M. I. T. As an electronics specialist with the Navy during the war his duties included those of Ship Superintendent for the Electronic Material Officer at the New York Navy Yard, Radar Officer on the staff of the Commander Gulf Sea Frontier at Miami, and Electronics Officer on the Battleship Indiana.

The accelerated development of electronics has given the merchant marine a tremendous boom in radar and loran, but has left personnel without the background necessary to realize the most from its use or to best administer the complex materiel problems. Mr. Chattin believes that he can best bridge that gap by serving in a consulting capacity for ship operators and setting up a well integrated preventive maintenance program for their electronic equipment.

BETHLEHEM *Certified* MARINE EQUIPMENT





Main Geared Turbine Propelling Machinery
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Fabricated Steel Construction—Weldments
Bronze, Iron and Steel Castings
Turbine Rotors, Blading and Accessories
Condensers, Feed Heaters, Lube Oil Coolers
Main and Auxiliary Circulating Pumps
Diesel and Steam Engine Parts
Oil and Water Separators
Special Valves and Fittings
Deck and Engine Auxiliary Machinery Parts
Scotch Marine Boilers

Our fully integrated technical and manufacturing facilities enable us to supply ship operators promptly and economically with a wide range of certified marine equipment from our own yards, foundries and forge and machine shops.

When you purchase Bethlehem's marine products, there are no divided responsibilities, no delays waiting for material or parts from other sources, and no added costs associated with handling and processing by several different concerns.

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STATEN ISLAND YARD
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SAN FRANCISCO YARD
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Alameda, Calif.

SAN PEDRO YARD
Terminal Island, San Pedro, Calif.

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Atlantic Yard
Simpson Yard

NEW YORK HARBOR
Brooklyn 27th Street Yard
Brooklyn 56th Street Yard
Hoboken Yard
Staten Island Yard

BALTIMORE HARBOR
Baltimore Yard

SAN FRANCISCO HARBOR
San Francisco Yard
Alameda Yard

SAN PEDRO HARBOR (Port of Los Angeles)
San Pedro Yard

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BETHLEHEM STEEL COMPANY
Shipbuilding Division
GENERAL OFFICES: 25 BROADWAY, NEW YORK CITY

Pacific Marine Review

NEWS FLASHES

THE BIG ARMY CONVERSION PROGRAM

Due for conversion at California yards in the near future are:

10 C-4 Army transports
3 C-1 Army Hospital Ships
2 C-3 Army transports

also for conversion on the East Coast are:

5 C-4 Army transports

The ten C-4's at West Coast yards are:

General Blatchford
General Greeley
General Brewster
General Autlman
General Freeman
General Hodges
General Morton
General Hase
General Collins
General Patrick

The three C-1's Are:

Mercy
Hope
Comfort

The two C-3's are:

Davis C. Shanks
Fred C. Ainsworth

The five C-4's on the East Coast are:

General Callan
General Ballon
General Taylor
General Muir
General Barry

The C-4's and C-1's will be converted to peacetime safety requirements, including improved fire protection and life boat equipment.

The Shanks and the Ainsworth have already been awarded to Bethlehem, San Francisco, and the Shanks is already in the yard. The aggregate cost of the two jobs will probably exceed $5,000,000.

Cost of the C-4 safety conversions will probably average around $500,000. One example of the way the bids run is in the case of the General Brewster as follows:

Bethlehem (San Francisco)	$622,634	90 days
Moore Dry Dock Company	570,000	110 days
Todd (San Pedro) Shipyard	561,694	90 days
United Engineering Co.	439,078	110 days

United gets the Brewster, Moore gets the Blatchford, Todd gets the Greeley.

* * * * *

COMPLETION DATES

The expected completion date for Matson's Lurline is now around March 1, and that for American President Line's President Cleveland is February 1.

* * * * *

GRAHAM GETS OAKLAND YARD

War Assets Administration on August 18 announced the sale of the surplus Moore Dry Dock Company, West Yard, Oakland, California for $2,750,000.

This facility, although an intact operating unit, formerly was used in conjunction with other plant facilities on leased lands in the construction of vessels for the U.S. Maritime Commission. It has been used by the Graham Company on a rental arrangement since August 1, 1946.

Graham Industries, Inc., composed of Graham Dry Dock Company, Graham-Doane Truck Company, Graham Re-Manufacturing Company, and Graham Durable Furniture Company, plans to consolidate its activities at the West Yard.

Graham Industries is to have the right to purchase the Administration Building, located partly on land included in this sale and partly on an adjacent tract, at a price to be established by WAA.

* * * * *

ARMY P-2's

Now at Newport News Shipbuilding Company for complete conversion to Army transport use are the big P-2 transports

Admiral W. S. Benson
Admiral W. L. Capps
Admiral E. W. Eberle

These jobs will run $5,000,000 each.

* * * * *

AMERICAN WELDING SOCIETY MEETING

President L. W. Delhi has announced the detailed program for the 28th annual meeting of the American Welding Society, to be held at the Hotel Sherman, Chicago, October 19 to 24.

* * * * *

BIG NEW DREDGE AND WORK BOAT CONTRACT

The U.S. Bureau of Reclamation has awarded a contract to the Pacific Coast Engineering Co., Alameda, California, for the construction of a 130 foot dredge for use on the Colorado River. The engine is Enterprise 1350 hp diesel, the cutter motor is Westinghous 250 hp. All electrical work has been let to Ets-Hokin & Galvan Co. There is also to be constructed a twin screw work boat with two 90 hp Sterling diesel engines. Total amount of the contract is $871,700.

* * * * *

IN ONE SAN FRANCISCO YARD ON AUGUST 25.

Dredge HOLLAND, U.S. Engineers--Overhaul.
SS ATASCOSA, Pacific Tankers--Repair & conversion.
SS HAROLD L. WINSLOW, States Marine Corp.--Miscellaneous repairs.
MS HUBERT PROM, French Shipping Mission--Conversion & repair.
MS SAINTE HELENE, French Shipping Mission--Conversion & repair. Undock 0700 Aug. 26.
YERBA BUENA, Army Transport Service--Drydock & repairs.
SS MOBILUBE, Gen. Petroleum Corp.--Conversion & repair.
SS RICHARD RANDALL, Gen. S.S. Corp.--Drydock & survey.
Tug GOV. MARKHAM, Bd. of State Harbor Com.--Drydock & miscellaneous repairs.
SS QUASTINET A.O.G. 39,Hillcone S.S. Co.--Drydock & survey. Undock 0700 Aug. 26.
USAT ADMIRAL W. S. SIMS, Army Transport Service--Damage repairs.
MS GUNNERS KNOT, Grace Lines.
MS LANCEWOOD, Martinolich--Drydock & miscellaneous repairs.

Left to right: W. J. Ruble; the new home of Submarine Signal Company; and Victor Battani.

New San Francisco Home of Submarine Signal Company

The Submarine Signal Company has moved its Pacific Coast headquarters to new and larger quarters at 49 California Street, San Francisco. Former offices were located at 86 Beale Street.

W. J. Ruble, Captain, USN (Ret.) is general representative and supervisor of the company's West Coast operations making his headquarters in San Francisco. He was formerly Director of the Naval Research Laboratory, Washington, D. C., Director of the Navy Electronic Laboratory at San Diego and in charge of electronics department of the Bureau of Ships, with responsibility for all research, design, procurement, installation and repair of radar, radio and sonar in the Navy.

The Submarine Signal Company maintains an engineering service of over 30 trained technicians on the Pacific Coast with offices in Seattle, Washington, Portland and Astoria, Oregon, and Eureka, San Francisco, Monterey, Wilmington and San Diego, California.

Victor Battani, who joined the company in 1934, after 16 years in the Navy, is District service manager at San Francisco. He has been with the company since 1934, except during the war period when he was recalled into service and served under Captain Ruble.

R. S. Smith Company Expanding At L. A. Harbor

R. S. Smith Company of Wilmington, California, announces the expansion of equipment and crews for additional marine painting facilities in the Los Angeles Harbor Area, and has recently acquired a 50-foot barge which is specially engineered for hull painting of all types of vessels, both at berth and in stream.

This company has been operating a marine painting unit in the harbor for the past two years, and feels confident that, due to the growth of the Los Angeles and Long Beach Harbors, their improved facilities to the shipowners will be welcomed.

This company's portable marine paint shop, as shown, was designed by Bob Smith, and when this unit rolls alongside a vessel, it brings all the equipment and material to complete the job. Fire hazards usually associated with marine painting are reduced to a minimum by the use of this equipment.

Bob Smith, Sr. and Bob Smith, Jr., and Dale E. Willis, who recently joined the organization as marine service representative, are well known in the Harbor Area and have a combined practical experience of 50 years, in both marine and industrial fields.

Senior R. S. Smith Junior

R. S. Smith and crew in service at Los Angeles harbor. ▼

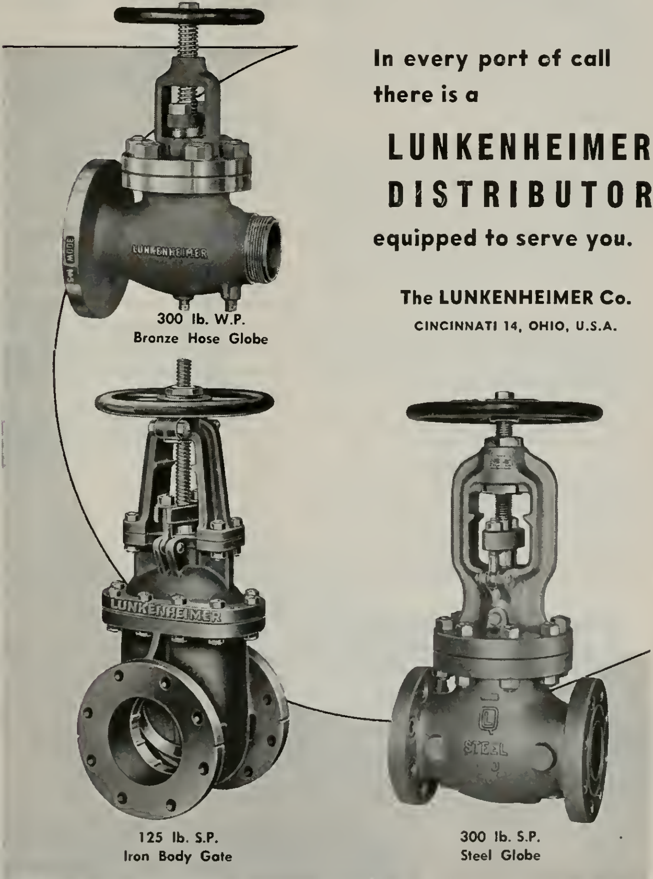
David P. Brown, appointed chief surveyor, American Bureau of Shipping, on July 31.

Arnott Retires; Brown Succeeds As Chief Surveyor

David P. Brown was appointed chief surveyor of the American Bureau of Shipping on July 31, succeeding David Arnott who has retired from active duty.

Mr. Brown has spent his entire career in ship classification work, having joined the Bureau in 1921. For the greatest part of this period he has been in charge of the hull technical work as an assistant to the Chief Surveyor. He was graduated from Massachusetts Institute of Technology in 1920, in the department of Naval Architecture and Marine Engineering. During his career with the Bureau he has served on numerous committees in the industry, among which are a special technical sub-committee to the 1929 International Safety of Life at Sea Convention; the sub-committee which was appointed under the Board of Investigation originated in 1943 by the Secretary of the Navy to inquire into the design and methods of construction of welded steel merchant vessels; and the working sub-committee of the ship structure committee which is now continuing the work of this Board under the direction of the Secretary of the Treasury. He is a member of the Society of Naval Architects and Marine Engineers.

David Arnott joined the Bureau in 1918. He had studied naval archi-



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1 FUEL OIL TREATMENT – Illustrated 4-page bulletin discussing Petroflo, liquid fuel oil treatment, which cleans fuel system from storage tank to burner tip and makes manual tank cleaning unnecessary. Discusses marine applications. XZIT Sales Co.

2 REFRACTORY COATING – Bulletin provides general information about Brickseal Refractory Coating, a combination of high-fusion clays and metal oxides mixed in oil which forms a highly glazed protective coating for refractory brick of all kinds. Shows uses, grades and results. Brickseal Refractory Co.

3 METAL PROTECTION – Fact-filled 4-page brochure explaining use of Serviron Metal Protector, a grease-like semi-plastic material which can be brushed or sprayed on metals for protection from weather, brines and alkalies. Especially suited to protecting and lubricating railroad switches, signals, and track parts. Serviron Metal Protector Company.

4 SOOT REMOVER – Attractively prepared bulletin contains considerable data on the use of XZIT Firescale & Soot Remover in industrial and marine fields. Shows stack temperature comparisons before and after using product. Offers five ways of reducing boiler operating costs. XZIT Sales Co.

5 REFRACTORY COATING – Bulletin gives information about the use of Vango Refractory Coating in crucibles, pouring ladles, forging and heat-treating furnaces. Discusses application, uses and effectiveness for all types of firebrick, cast or plastic refractories. Vango Refractory Company.

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(Continued from page 93)

tecture at the Royal Technical College, at Glasgow, Scotland, following which he served his apprenticeship in shipbuilding at the Fairfield Shipbuilding and Engineering Co., Ltd., Glasgow, and has been Chief Surveyor of the American Bureau since 1925. To his duties as chief surveyor were added, in 1938, those of Vice President.

Many contributions have been made to the science of welding in ship construction by Mr. Arnott. Recognition of his efforts culminated in the presentation to him of the Miller Memorial Medal in 1941, by the American Welding Society.

PAUL W. HILLER HANDLES SPERRY CONTROL

Paul W. Hiller in Wilmington, is Southern California distributor for the new miniature Sperry hydraulic remote control unit, that was mentioned in the July issue of Pacific Marine Review.

The Sperry Control has great appeal to small commercial boat owners and to the pleasure boat owners, although many uses can be found on the larger ships. A stock is carried of both the F and H controls which are suitable for auxiliary generator, throttle or governor controls; and the Hiller organization is fully prepared to maintain and service this equipment.

Other lines handled by Paul W. Hiller are: De Luxe Oil Burners, Ingle Ranges (Valjean process), Victor Welding Equipment, Delco-Light Products, Sherrill Marine Compasses, Kidde Lux Fire Systems, Rich Selex Zonite (Fire Detecting Apparatus), CO_2 Refills, "General" & "Shur-line" Fire Extinguishers, and The Pitometer Log.

This firm is located at 315 Avalon Boulevard, Wilmington.

GURALNICK TAKES SALES AGENCIES

Marine Plastics

Morris Guralnick, naval architect and marine surveyor of San Francisco, has been appointed West Coast representative for Marine Plastics Company of New York. Mr. Guralnick will be sales agent for their dehydrating equipment which has been installed on more than fifty turbo-electric drive vessels flying United States and foreign flags. The equipment is easily installed on the main propelling motors and, by maintaining a dry atmosphere in the casings, has contributed in large measure to lowered upkeep costs. A vapor alarm which is part of the dehydrator, warns of leaks in the main motor cooling system long before the danger is otherwise visible. This feature has saved several motors from severe damage.

Farbertite

Guralnick has also been appointed representative for Farbertite rust preventive composition. A non-inflammable, water-proof coating for steel, Farbertite has enjoyed excellent sales for over ten years on the East and Gulf Coasts and is now being introduced locally. The use of this product provides an inexpensive method of obtaining rust free surfaces. This factor is especially important today when costs of making repairs and conversions are again of primary importance. Since the prevention of rust on shipboard is a universal problem, the uses of Farbertite are very general, finding extensive application to tank tops, bilges, under insulation and decorative decking, and on other moist surfaces. The product is manufactured by the Briggs Bituminous Composition Company of Philadelphia.

OBITUARY

Harold John Warren Fay, president Submarine Signal Company, and internationally recognized authority on marine safety devices, passed away August 14, at the age of 71.

THE ACCURACY OF AGETON'S METHOD IN CELESTIAL NAVIGATION

(Continued from page 76)

1=20° 24′.0 N.; Hc=16° 20:3. Ageton's tables, without interpolation, give 16° 14′.5; the error in this example in which both K and LHA lie outside the forbidden range, is accordingly 5′8. When the latitude is altered to 45° 52′.0 N., the altitude becomes 32° 33′.8 and the error is less by only one minute.

EXAMPLE B: LHA=89° 17′.0 W., d=45° 0′.0 N., L=22° 48′.0 N.; Hc=16° 23′.4. The error by HO 211 is 29′.4.

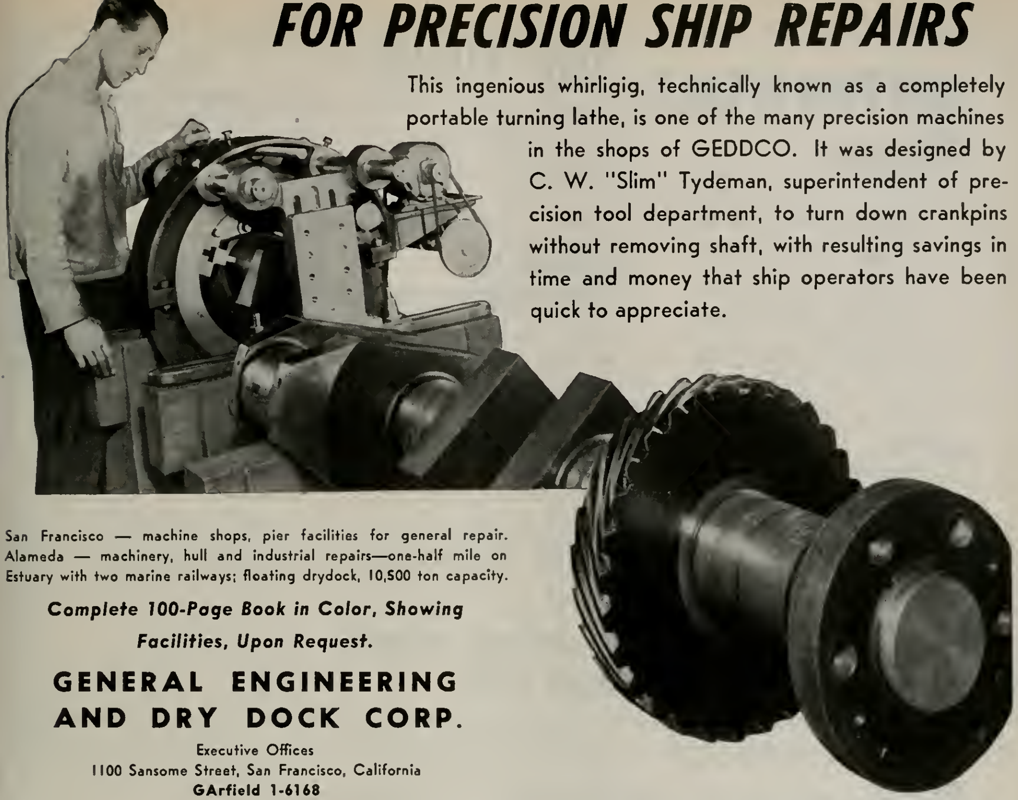
EXAMPLE C: LHA= 17° 18′.3 E., d=23° 31′.3 S., L=19° 51′.8 N.; Hc=43° 27′.0. The error (1′0) shows that the published estimate may be doubled even when the local hour angle is small. This example is a variant of Ageton's problem III, p. 8.

The fact that the errors in examples A and B are reduced to 1′6 and 1′7 by interpolation suggests that the "caution" was formulated as a result of an investigation which did not take into account the additional large errors resulting from the neglect of interpolation. Since the "caution" suggests the discarding of sights when $87\frac{1}{2}° < K < 92\frac{1}{2}°$ as a "good plan" merely, it is highly probable that the sea navigator would ignore it when satisfied with an accuracy of "one or two miles." This probability is heightened by Ageton's ommission of the caution from his *Manual* and similar ommissions from several of the navigation texts which reproduce the tables.

Figure 1 may be used practically as an indicator of the areas in which interpolation is necessary. The interpolation of B(R) from A(R) will alone reduce the maximum error to about two miles for K=90°, 0.8 mile for K=80°, and thus bring the error within practical limits for most navigation problems.

If the marine navigator, accordingly, is content with a maximum error of two miles—at night a fix by several stars will reduce the probable error much below this—he may use Ageton's tables, interpolating B(R) from A(R) only in the range $82° < K < 98°$. For practical purposes this may be regarded as a range of LHA instead of K. He may avoid this range at night, of course, by avoiding stars near the hour circle passing through the west and east points. If he desires greater accuracy, he must interpolate over a larger range, and discard sights without choice in the narrower range specified by Ageton.

For various reasons, as previously outlined, Ageton's tables will probably continue to maintain a certain popularity with marine navigators. The brevity of the computation procedure when using HO 214 or HO 218 does not, for those willing to do a bit of computing, overbalance the convenience of having all necessary tables contained in one inexpensive pocket-size volume. When using the tables, however, the navigator should beware the pitfall of a possible error of as much as 30 miles difference between his actual position and his computed position.




PABCO BOTTOM COMPOSITION
BRAND "B"
BRAND "C"
BRAND "D"


PABCO
MARINE FINISHES

KEEP POSTED

New Equipment and Literature for Yard, Ship and Dock

ELECTRONIC AREA METER DEVELOPED

Bailey Meter Co. of Cleveland, Ohio, has developed a new electronically-operated area meter which accurately measures liquids such as: black tar, chemicals, distillates, and refrigerants as well as freer flowing liquids. This flow measuring instrument consists of a specially designed telemetering transmitter connected to a standard Bailey electronic receiver. The transmitter is easily installed in the pipe line, much like a valve.

G. E. ELECTRONIC POSITIONING CONTROL SYSTEM

A new electronic positioning control system designed for such applications as accurately controlling inaccessible dampers from control stations on the floor, positioning heavy work in machine tools without time-consuming hand labor, and opening, closing, and adjusting the intermediate points valves and gates from a single co-ordinated control desk has been announced by the Control Division of the General Electric Company.

The system has three parts, a master control station and a follow-up device, which can be either small selsyns or potentiometers depending upon the application, and an electronic control panel. The driving motor is not included in the system because any reversing ac or dc motor that can handle the load is acceptable.

The master control station may be placed in any desired location, because it is connected to the control panel by just three control leads. To operate, a dial is set in the same manner as a radio dial, and the motor moves the load to a new position corresponding to that of the dial.

G.E. Electronic Positioning Control System.

The new system can be used on drives up to 1½ hp in general, and on many drives over this rating, after consideration of inertia of the load, speed, gear reducer arrangement, and accuracy of positioning needs.

The control panel is enclosed in a NEMA Type I case and is hinged to swing out for easy servicing and inspection. The basic components of the system are standard control devices which have proved adequate and durable over long periods of operation.

MARINE RADIO REPAIR DEPOT

A complete marine radio repair depot has been opened at Manila, Philippine Republic, by the Marine Division of the Mackay Radio and Telegraph Company.

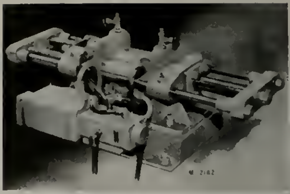
The depot is another link in an international chain of marine service stations and agencies maintained at 152 principal ports by Mackay and its associated companies throughout the world for repairs and maintenance to all types of marine radio communication, direction finding and other shipboard electronic equipment.

C. H. WHEELER ACQUIRES SELLERS' MARINE DIVISION

The C. H. Wheeler Manufacturing Company, of Philadelphia, announces the purchase, in its entirety, of the marine division of the Wm. Sellers & Co., Inc., of the same city.

The purchase includes all inventory, engineering and patterns, and this acquisition by the C. H. Wheeler organization will enable them to add the hydraulic, springless, automatic, self-centering telemotor developed by Sellers, to the present Wheeler products.

This telemotor supplements the Wheeler deck machinery line which includes steering gears, windlasses, winches, capstans, cargo cranes, automatic tensioning hoists and cranes and the company's other widely known products, the Tubejet steam jet air ejectors and the C. H. Wheeler marine condensers.



Automatic centering hydraulic telemotor of C. H. Wheeler Manufacturing Co.

C. H. Wheeler is best known among industrial and utility engineers for nearly 50 years activity in the manufacture of steam condensers, pumps and cooling towers, and its pioneer work in the development of steam jet vacuum pumps.

SCINTILLA MAGNETO BUS-K-NECT

Scintilla Magneto Division of Bendix Aviation Corporation, Sidney, N. Y., has designed a useful gadget, the Bus-k-nect, to speed up battery changes, cut maintenance costs, reduce fire hazards on buses, trucks, or other heavy-duty motor vehicles requiring frequent battery changes. It is easy to install and operates by a mere twist of the wrist. It may be used in both single-battery and dual-battery installations.

The design of the Bus-k-nect consists of a molded-junction box of high impact material, accommodating three terminals in a compact arrangement, complete with hinged cover which affords additional protection to the connections. It is about 4½″ long, 2″ wide and 1¾″ high.

Cable terminals fit securely in the spring contacts. Terminals are furnished in three different sizes, with cable holes 3/8″, 7/16″ or 1/2″ in diameter. This permits the user to choose a size to fit the cable best adapted to his own purposes.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TEXACO MARKETS PREMIUM WHITE GASOLINE

Nation-wide distribution of the new premium quality Texaco Marine White Gasoline has been announced by the Marine Sales Division of the Texas Company. This new fuel is available to motor boat owners at Texaco Marine Service Stations on the waterways of the Atlantic, Pacific and Gulf Coasts, the Great Lakes and their connecting waterways.

The new product gives knock-free performance and assures maximum power and fuel economy in both inboard and outboard gasoline engines. This performance is obtained by virtue of the antiknock quality and balanced volatility of the gasoline, which enable it to be used at optimum spark settings in all types of marine engines.

Texaco Marine White Gasoline is water-white in color and by reason of its special treatment will remain stable for long periods of time, regardless of whether it is stored in iron or copper tanks. Neither tetra-ethyl lead nor inhibitors are needed or used in achieving the high quality of this product, which does not contain any material that is unstable in the presence of copper and hence will not form gum in fuel tanks or lines.

A large number of motor boats in use today are equipped with fuel tanks, lines, and other parts of the fuel system made of copper or alloys containing copper. Copper and its alloys, as well as some other metals, are active catalysts which accelerate gum formation when they are in contact with ordinary gasolines for lengthy periods. In tests it was found that even after six months storage at summer temperatures in contact with copper, the new Texaco Marine White Gasoline developed no appreciable gum or gum formation tendencies.

NEW TEXACO CRUISING CHARTS FOR ATLANTIC AND GULF

Covering the Atlantic and Gulf Coasts, the Hudson River and Lake Champlain waterway, and the Great Lakes, the new edition of Texaco Cruising Charts is being distributed to the boating public.

Each Texaco Chart covers a fairly large area of coastline and enables the yachtsman to see at a glance his possible cruising grounds, instead of going to the trouble and expense of acquiring a great number of large scale navigation charts.

Principal lights and buoys are shown. Tide tables, good until December, 1947, are contained on the reverse sides of the charts as well as much current data and larger scale guides of the principal harbors and bays.

Refueling points, Texaco of course, are shown on the faces of the Charts by red stars, Texaco Mailports, a service originated by Texaco Waterways Service in 1935, are indicated and a complete listing of Texaco waterfront service stations is given on the inside cover of each chart.

KEEP POSTED

The details of new equipment or the new literature announced in this department will be furnished without obligation on your part. For quick service, please use this coupon.

PACIFIC MARINE REVIEW

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BUSINESS...

ADDRESS..

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GETTY

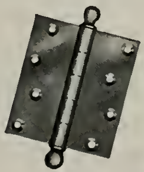
TRADITIONS OF THE SEA

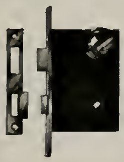
1922 25th Anniversary 1947

Traditions of the sea, many of them aged-in-the-wooden sailing vessels, inherently have their roots in respect for honest labor, the satisfaction of work well done. No less do the traditions of a company such as Getty have their foundation in the same feelings of pride in worth-while accomplishment.

The integrity of a man, the reputation of a company, the soundness of a product, still have meaning in today's world and today's market.

For a quarter of a century, Getty has produced marine hardware for the ships of America . . . ships of commerce, ships of pleasure, ships of war. Getty will continue to achieve the same sincerity of craftsmanship as it has in the past. The complete Getty line of fine marine hardware cannot be shown here, but you may be assured that the skill of our men, perfected by years of experience, will apply to the smallest detail so that the name of Getty, as always, will be synonymous with Quality.





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10 Ton CLYDE CARGO: 8" x 14" Single Drum
5 Ton HESSE-ERSTED CARGO: 6" x 12" Double Drum
Gasoline powered towing winches two speed with port, starboard and large center drum.

BLOCKS

New—Snatch: 12" for 3/4" wire line

BOILERS

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A NEW BOOKLET ON FIRE CHIEF fire-resistant canvas has been recently published by Wm. E. Hooper and Sons Co., of Philadelphia, Pa. The booklet describes the many characteristics of "Fire Chief" treated canvas, including resistance to fire, water, wear, weather and mildew. It also shows typical applications of the product in different climates, in many industries where canvas is used. An especially interesting section tells about the many field and laboratory tests which Fire Chief canvas undergoes in a continuous research and development program.

* * *

LESLIE CO. ENGINEERING DATA BOOKLET: A recent 12-page bulletin, No. 467, published by the Leslie Co., Lyndhurst, N. J., manufacturers of pressure and temperature regulators and controllers, strainers and whistles, is titled "Engineering Data and Reference Tables," which will be an invaluable aid to the engineer in laying out piping and associated equipment. This collection is a compendium of handy information for calculations on piping, pumps, heaters, traps, reducing valves, temperature regulators, pump governors, pressure controllers and other such equipment.

* * *

BULL & ROBERTS OF NEW YORK, have published a booklet called "Chemistry Serves the Marine Industry." The object of this booklet is to illustrate some of the ways in which chemistry does serve the marine industry and suggest others. Since the firm was founded in 1903, Bull & Roberts have specialized in applying chemical knowledge to marine problems, and this booklet compiles the firm's experience and that of their staff of technicians.

THIRD DIESEL CONFERENCE

The Diesel Engine Manufacturers Association is holding the third of its series of marine conferences in Boston, Mass., on September 12. Key representatives of marine interests will be invited by the manufacturers to spend an informal day with them on that date at the Copley Plaza Hotel, to tell their experiences with diesels and to state explicitly what their power needs are.

The manufacturers will outline to shipbuilders, ship operators and naval architects what they have to offer in the way of engines for both propulsion and auxiliary purposes. The session will be concluded with a question and answer period.

Speakers who have been invited to appear on the program include W. S. Newell, president of Bath Iron Works, Bath, Me.; Irwin Usen, president of Usen Trawling Co.; J. L. Alphen, president, General Sea Foods; Frederick B. Craven, manager marine department, Mystic Steamship Division, Eastern Gas and Fuel Associates, and vice president Boston Towboat Co.; and Adm. E. L. Cochrane, who at the time of the meeting will be head of the Naval Architects School of Massachusetts Institute of Technology.

Presiding at the meeting will be E. J. Schwanhausser, vice president of Worthington Pump and Machinery Corp., and president of Diesel Engine Manufacturers Association. The question and answer period will be conducted by Robert H. Morse, Jr., vice president and general sales manager of Fairbanks, Morse & Co.

The first of the series of marine conferences was held by Diesel Engine Manufacturers Association at San Francisco last November. In March of this year the second conference took place in New Orleans. Both sessions attracted large audiences of maritime men, who showed keen interest in the programs.

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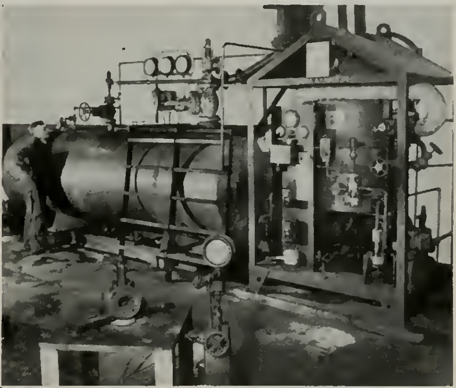

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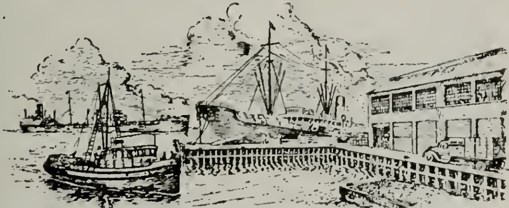

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REPAIRS TO WELDED SHIP HULLS

(Continued from page 46)

changes quickly as at a hatchway or superstructure the forces produced vary tremendously and tend to concentrate at the break. Note that we are talking about a monolithic structure in which all parts help carry the load. If, for example, a superstructure were merely resting on deck, free to move independently, it obviously would not influence the strength of the ship or cause any concentration of stress at its ends. A riveted ship's superstructure does not enter into the structural reaction nearly so completely as does a welded house.

In this connection it may be interesting to point out the experience of our company in connection with the construction of the C1-B vessels which were built before the war and the Libertys built at Bethlehem-Fairfield. At the time of the basic design on the C1-B, it was felt that the shell or envelope of the structure would tend to shrink onto the interior structure as it was being erected which would place this envelope in a condition of strain. When later longitudinal forces were imposed on the structure it was felt that perhaps we might get into difficulties as a result of this initial shrinkage. It was accordingly determined to rivet the seams of the shell, a practice which was followed on the Bethlehem Libertys later on.

There have been but two failures of vessels of this design. The first the *John Sergeant* developed a crack when operating in a heavy sea in loaded condition. The crack was on the port side in way of accommodation ladder recess and extended to the riveted seam and riveted deckhouse connection. The second casualty was on the *Samuel Chase* where a butt weld cracked, possibly due to a faulty weld. In the overall picture of serious fractures, the record of the Bethlehem-Fairfield Liberties was exceptionally good, especially when one considers the large number built.

When we consider the action of a wholly welded structure or monolithic structure we first encounter the problem of restraint. When portions of a structure are said to be in restraint we mean that various elements of the structure itself prevent movement of other parts which would tend to relieve or distribute the stress. Here again an over-simplification may help in visualization.

Let us consider a perfectly round tree trunk, it can sway in any direction and bends with the wind. It is indifferent to direction of the wind and resists equally well in all directions. Now let us visualize a board set in the ground. It will resist winds in one direction by its rigidity and will break before bending. A wind at right angles will bend the board and it will accommodate itself to a stress in this direction. Thirdly, let us imagine a

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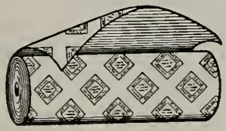

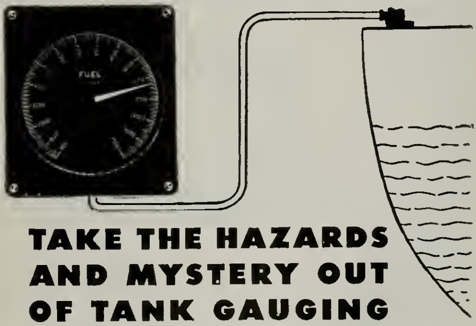
FUEL

REPAIRS TO WELDED SHIP HULLS

(Continuation from page 106)

board shed, four-sided and hollow. It will not accommodate itself to any stress, but must break or collapse if the wind blows hard enough. These three states of structure can be labeled "stick," "panel," and "chunk." As we biuld a ship we take "stick" like pieces and make "panels," bulkheads for example, and so tie them together as to restrict their motion in one direction. Later we take "panel" like pieces and make "chunks." Then last of all we assemble "chunks," each rigid in its own right, into a ships structure. In considering the complicated pieces which form a ship we cannot, of course, say that any one unit acts purely as a "stick" or "panel" or "chunk." Actually the action is usually a combination of these three phases.

The process of assembling "chunks" is at once the chief advantage of welding and one of its greatest difficulties. If, during this process the members are so joined as to be free to creep or move in accordance with their nature, that is "stick-like" or "panel-like,"—at the moment of their joining, they will accommodate themselves to the strain caused by the welding heat. Careful dimensional control must be exercised during this process so that the panels will fit together without causing distortion of the "chunk" and without creating the necessity of forcing the material either together or apart by violent methods. Again the "chunks" must be accurate so that they meet exactly and need not be forced into place.

Most of the Libertys, Victorys, and T-2 tankers were built with these principles in mind and show no evidence of strain due to assembly. There are, however, some exceptions where the distortions are all too apparent.

It is of course obvious that you cannot jack or pry or in any way force steel out of its natural position without putting a strain on the members. If, now, in addition to such a strain, we make a welded joint exactly at this point, as is usually the case, it must resist the tendency of the steel to fly back into place. These stresses are avoidable and should not occur in a well built vessel.

Aside from these external forces acting on a welded joint, we have the internal force caused by the heat of welding and its attendant shrinkage. If the parts can move they will do so and relieve the stress. If they are really restrained the metal itself will be severely stressed and may even fracture. As far as is known, inherent residual stresses due to welding are unavoidable in practical weldments. The Board of Investigation previously mentioned came to the conclusion that in a properly built ship these so-called locked-in stresses were not a major factor. If, however, they have been built into the ship in combination with the discontinuity of structure and restraint, they *may* be a factor, being a local spot so close to the breaking point that any external force may be sufficient to cause rupture, particularly if there also exists at the same spot some welding fault of the nature previously shown.

The summation of all the internal forces in the material itself can be labeled as "stress." The basic relation of the elements thus discussed is that the bending moment is the product of the stress by the section modulus.

As a result of experience with wartime built vessels and a large amount of study which has already been done, we now feel that in building we can avoid serious difficulties. We can do this by proper design, avoiding or reinforcing abrupt changes of section, avoiding sharp corners, by the use of careful methods of assembly and proper attention to the sequence of erection. Present day technique generally involves the use of some riveting in the larger ships. Last of all, the welding can be performed with proper sequence and with due regard to workmanship.

(Editors Note: Part II of Mr. Rechtin's article will deal with solutions of the problem and methods of repair. It will appear, with many illustrations, in October Pacific Marine Review.)

TURBINE-ELECTRIC PROPULSION

(Continued from page 54)

peller, this type of braking action is ineffective, as no generator is capable of producing voltage at standstill.

Dynamic braking cannot therefore be used alone, as the motor still has to be brought to a standstill, reversed, and brought up to its slip speed as an induction motor before it can be synchronized.

Superimposing both the dynamic braking and plugging torque curves over the propeller torque curve, the change-over points can be readily visualized. These curves are shown in Diagram 8.

Propeller Torques During Reversals

A ship's propeller when being driven in the forward direction must have sufficient slip so that a column of water is thrown aft. This column of water may be likened to a jet. The reaction from this jet is imparted from the propeller through the line shafting and thence to the thrust bearing, thereby driving the ship in a forward direction. At zero slip, there is no jet and therefore no thrust.

The slip on a propeller is similar to the slip on an induction motor where zero slip corresponds to zero torque.

The actual slip (not the observed slip) on a ship's propeller when operating at normal rated power and rpm is approximately 30 per cent for normal efficient designs. If the power is quickly cut off from the propeller when the ship is moving ahead at 100 per cent speed, thereby allowing the propeller to turn freely, the propeller speed will drop to approximately 70 per cent of its normal speed. Except for the small amount of power required by the propeller to overcome line shaft friction, this is the point of zero torque.

The factors which tend to slow down a ship of its own accord consist of two factors: first, the skin friction, and second, the wave making resistance. The proportion of these two components vary widely on different types of ships. In light high-speed ships the wave making resistance may account for as much as 60 to 70 per cent of the total resistance. This function is tied in closely with what is known as the speed length ratio of the ship. Be-

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TURBINE-ELECTRIC PROPULSION

(Continued from page 108)

low speeds of 10 to 12 knots the wave making resistance becomes almost nil unless the ship is very short. Ships which have a high wave making resistance slow down quite rapidly until they reach a speed where the skin friction accounts for most all of the total resistance. The stored energy in the moving hull due to its weight and velocity must in any case all be absorbed before a ship can be brought to a standstill.

Ships of heavy tonnage driven at moderate speed, and especially those with a favorable speed length ratio, slow down of their own accord less rapidly than a high-speed ship of low tonnage, primarily because the wave making resistance is less of a factor, and that their stored energy is higher.

In slowing down a ship by means of a propeller, a counter-torque is applied to the propeller which places the slip on the opposite side of the propeller blades. Again propeller slip becomes a measure of torque.

To gain immediate possession of a propeller and rotate it in the reverse direction, when a ship is moving in the ahead direction driving the propeller as a water turbine, would require a torque in excess of the breakdown torque of the propeller. The breakdown torque of a propeller is attained at the point of cavitation, that is where the pressure per square inch of surface area exceeds the total head of water above it.

On single-screw ships the application of counter torque to a propeller when it is still being driven ahead as a water turbine by the ship's momentum has a tendency to keep the water from flowing in behind the hull. The lowering of the static head of water above the propeller blades therefore causes the propeller to break into cavitation much more rapidly than if the head of water above the blades could be sustained.

The action of the propellers on a twin-screw ship is quite different than on single screw ships. Wing screws are placed in the open water at the side of the ship where the flow of water to the propeller is unrestricted. This maintains the static head of water above the propeller blades and therefore causes cavitation to take place much later than on single-screw ships.

The ability of any type of propelling equipment to gain immediate possession of a propeller, as previously stated, depends upon the margin of torque that it can exert over and above the breakdown torque of the propeller. The design problem is to provide enough torque and heat absorbing capacity, and this involves such questions as: (1) the opposing torque and thrust produced by the propeller during cavitation; and (2) shock to the equipment, etc. From a scientific point of view the greatest retarding torque would be produced at a point before cavitation is reached. Whether this retarding torque is accomplished by applying maximum torque to the propeller when it is still turning in the forward direction with negative slip, or is attained by running the propeller through its point of cavitation, then at some slow speed in the reverse direction, is of little consequence in the slowing down of a ship providing the end results are the same. In either case, the stored energy in the ship due to its forward momentum must be absorbed before the ship can be brought to a standstill.

Control Changes on the P-2 Ships

The government specifications covering the P-2 class of ships called for crash reversal tests at both the normal rating of 18,000 shp and 120 rpm, and at the maximum rating of 20,000 shp and 124 rpm. These ships are 610 feet long, have a beam of 75 feet, weigh 21,900 tons and have a normal rated speed of 21 knots. The propellers are highly efficient and have an exceedingly high breakdown torque.

In the crash reversal tests which were made on early ships of this class, the squirrel cage windings on the motors were subject to overheating because of the prolonged and high propeller torques encountered when used for plugging. The time element involved in slowing down the ship to a point where the motor torque exceeded the propeller torque imposed an extremely heavy duty on these windings. The combination type of dynamic braking and plugging control was, therefore, added to reduce the heating in the motors' squirrel cage windings.

In all Naval ships, and ships used for Naval auxiliary purposes, the ability to make crash reversals is of primary importance. However, ships used for commercial purposes are rarely called upon to undergo this severe type of operation, except in time of great emergency to avoid collision. Under normal operating conditions, merchant ships slow down when entering harbors, maneuver at slow speeds, and are berthed by means of tugs. Under these conditions, dynamic braking is not required.

From a strictly engineering point of view, however, the crash reversal tests on the P-2 ships, when using dynamic braking as a means for absorbing the tremendous amount of stored energy in the moving hull quickly and thereby reducing its initial high speed quickly, are highly interesting.

Diagram 9 shows the propeller rpm plotted against time, when making a crash reversal from a top speed corresponding to 126 rpm.

The curve is clearly divided into A, B, C, . . . sections and marginal notes added to explain what takes place during the propeller cycle from full speed ahead to astern revolutions.

It will be noted on curve 9 that the rpm of the propeller at the start of the cycle is 126 rpm, and that after a duration of 12 seconds it has fallen to a value of 86 rpm. The propeller is turning freely at this point without any power applied in either direction. The ratio of the rpm at zero slip and full speed with power applied is therefore 86:126 or 0.685 to 1.0. The propeller at zero slip may be taken as an indication of the full speed of the ship, disregarding the small diminution in the ship's speed over a period of 12 seconds. This point is marked (1) on the diagram.

A similar point of zero slip is marked (2) on the chart. This corresponds to 52 rpm and was attained after a period of dynamic braking for 30 seconds. The ratio of the rpm values at zero slip should therefore show the relative reduction in the ship's speed between these points. This amounts to 52/86 or 0.605.

If the ship was moving ahead at 21 knots at top speed, then it was moving ahead at approximately 21 × 0.605

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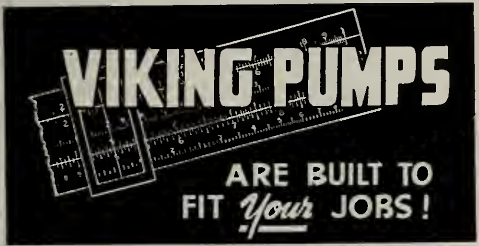

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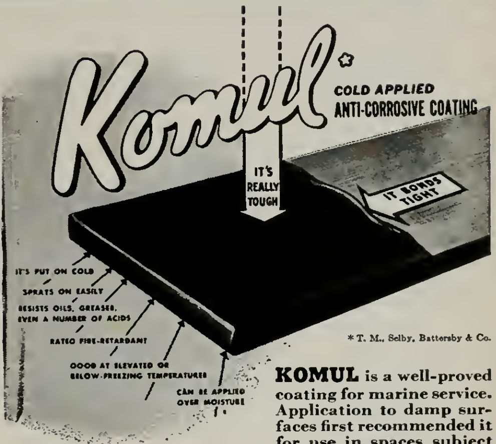

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TURBINE-ELECTRIC PROPULSION

(Continued from page 110)

or 12.7 knots at the time dynamic braking was discontinued and the control shifted to motor plugging. The real value of dynamic braking as a means for quickly slowing down a ship is quite evident from the foregoing test values. Slowing down a 21,900 ton ship from 21 knots to 12.7 knots in a matter of 46 seconds from the time signal was received from the bridge and in 30 seconds from the time dynamic braking was applied may be considered quite a feat in itself.

Diagrams 10 and 11, in addition to the propeller rpm, show shaft torque, line current, line voltage, and generator field current plotted against time for the same crash reversal shown on diagram 9.

Change in Operating Procedure on P-2 Ships

The addition of dynamic braking on the P-2 types of ships naturally required several control changes to prevent an operator from executing a crash reversal by means of the plugging action of the squirrel cage winding alone above certain ship speeds.

For ship speeds corresponding to propeller speeds above 70 rpm, dynamic braking was deemed advisable, and for ship speeds below this value, unnecessary.

The means employed to safeguard the apparatus consisted of signal lights and an interlock on the reversing lever which prevents its operation at propeller speeds above 70 rpm. The signal lights consist of a red light which shows as long as the reverse lever remains in the locked position, and a green light which lights up when the interlock automatically releases.

To complete operation for a crash reversal from a ship speed above that corresponding to 70 rpm is as follows: 1. Move turbine speed lever to *maneuvering* position. 2. Move field lever to *off* position. 3. Move reversing lever to *off* position. The above operations entirely cut off the power supply to the propelling motor. 4. Close dynamic braking switch. Dynamic braking continues until red light goes off and green light comes on. 5. Move reverse lever to *reverse* position. 6. Move field lever to position *one* and maintain in this position until motor has reversed and attained its slip speed as an induction motor. This is indicated when the line current has decreased to a steady value. 7. Move field lever to position *two*. This applies field current to the motor quickly briging it into synchronism. 8. Move field lever to position *three*. This action restores normal excitation on the generator field. 9. Move turbine speed lever to give desired revolutions astern.

The operating procedure is shown graphically in Diagram 11.

Excitation System on the P-2 Ships

Under normal operating conditions each main generator supplies current to an individual propelling motor. Cross-over connections are provided, however, which permit both propelling motors to be operated at reduced powers from either main generator.

One exciter generator and one booster exciter normally supplies the field current for one generator and one motor. The rating of the exciter generator is 200 kw, three wire, 120/240 volts, and the rating of the booster exciter 50 kw.

Under normal operating conditions the generator field excitation is supplied at 120 volt from one side of the line to neutral, and the motor field excitation at 120 volt from the other side of the line to neutral. Both of these excitation circuits are adjusted manually by means of field rheostats for current values recommended in the manufacturers instructions.

The booster exciter is connected in one leg of the generator field circuit. Under normal operating conditions this booster exciter runs freely without field excitation. The field of the booster exciter is controlled automatically by means of a voltage regulator which applies field only in case of a drop in line voltage, which results from heavy current demands caused by rudder movement and heavy seas.

The booster exciter-voltage regular combination assures that constant voltage per cycle will be maintained irrespective of the current demands, thereby preventing the motor from dropping out of step at all times.

Diagram 13 shows graphically the test results of the full power steering tests on the P-2 vessels. Shaft torque, generator field amperes, propeller rpm, rudder position, line amperes, and line volts are plotted against time and the regulator action during peak torque periods is indicated by the increase in the generator field current. The drop in line voltage and increase in line current during these high torque periods is also readily seen on Diagram 13.

Temporary Overexcitation of Generator Field During Maneuvering

When operating on the squirrel cage winding, which occurs when accelerating the motor from rest, and also when gaining possession of the propeller from reverse rotation, overexcitation of the generator field becomes necessary. This temporary overexcitation amounts to approximately 300 per cent normal current. This overexcitation is accomplished by connecting the generator field across the 240 volt bus of the three-wire generator and applying full field to the booster exciter. The connections for this overexcitation are made when the field lever is moved to position one, and restored to normal when the field lever is moved to position three. This overexcitation can be seen graphically on Diagram 11.

Conclusion

The addition of dynamic braking and voltage regulators on these electric drive ships and the complete tests that were made was one of the more interesting developments of marine engineering during the World War II period.

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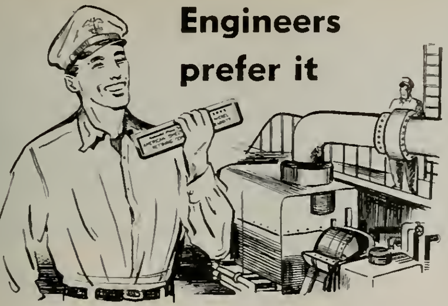

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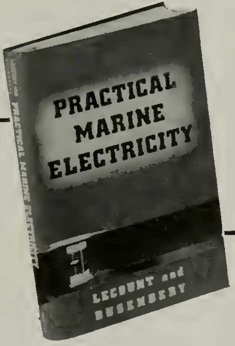

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GENERAL MACHINE and REPAIR WORK

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TODD COMBUSTION EQUIPMENT, INC.
(TODD OIL BURNERS)

COLUMBIA MACHINE WORKS

L. K. Siversen, Owner

THornwall 3-1636 **BERKELEY, CALIF.** 7th and Carlton St.

REDESIGN FOR POSTWAR TRAVEL

(Continued from page 64)

which represents a major sphere of the American President Lines' global service.

The walls are curved in slightly to mark the transition from the public space to the semi-private consultation area, and this area is carpeted in cool green with walls of rift-oak Flexwood. The right wall is zig-zagged, and attached to the wider sides of the angles are three specially designed consultation desks, equipped with storage space for all necessary literature. This arrangement gives an effect of privacy for each group seated around the desks.

Opposite these desks is the main stairway connecting the first and second floors. This is an interesting free-standing flight executed in dark green terrazzo, the steps set at a slight angle to the wall. The railing consists of steel tubes extending from steps to ceiling. As this stair appears to be supported only at top and bottom, open underneath, it does not diminish the apparent floor space of what is, after all, a small room. In the wall at the foot of the stairs a series of brilliant Kodachrome transparencies are set in circular steel frames, simulating portholes.

On the second floor are private offices, secretaries' room, toilet facilities, and two private consultation rooms which can be thrown together to make a fairly spacious projection room for showing of travel films. Ceilings in this area are cocoa brown, with walls of light-yellow plaster or rift-oak Flexwood. There are file and storage rooms at the rear of both floors, with a private utility stairs connecting them.

(Part II of this article, on the San Francisco and New York offices will appear in our October issue.)

NEW BETHLEHEM STORES

With a gala Open House, Bethlehem Supply Company of California announced the opening of their newest field store. This new store, known as the Wilmington field store, is located at 1605 Santa Fe Avenue, in Long Beach, and will serve the drilling and refining phases of the petroleum industry in the harbor area.

The opening of this new store follows by only two months the opening of the greatly enlarged and modern Bakersfield store where a "highly successful" open house was held in late May. Leading drillers, refiners, and industry representatives of the San Joaquin Valley were present.

This expansion of facilities to better serve the petroleum industry in California is a part of the expression of confidence of the company, now in its 25th year, in the future of the industry locally. In the past, when new fields were discovered and developed, the company, then known as Petroleum Equipment Company, was among the first to establish new stores. Today, with the new Wilmington field store, Bethlehem Supply Company operates 10 field stores located in the major California oil fields in addition to offices and warehouses in Los Angeles and San Francisco.

Effective August 1, J. R. B. Freeman, formerly Refinery Sales Representative in Los Angeles for Bethlehem Supply Company of California, has been appointed district manager of the San Francisco area. W. H. Weitzel will continue as manager of the San Francisco store. The new position has been created to further improve Bethlehem Supply service in the Bay Area.

In Los Angeles, R. B. Trimble will take over J. R. B. Freeman's activities under the direction of H. E. Chapman in Refinery Sales; R. A. Casson, in addition to his duties in the sale of pumping units, will take over R. B. Trimble's work in the sale of sucker rods and wire rope.

"BELIEVE IT OR NOT"

Norman Proffitt of Pacific Sales and Equipment Company in San Francisco, tells this "Believe it or not" telephone conversation:

"Aetna Marine Corporation," voice says.

"Yes, may we help you?"

"Where can I go to sign up for a ship?" voice asks.

"I wonder if you have the right number—I'm afraid I can't give you that information."

"Well, I didn't know where to go. I'm a sailor in San Francisco for the first time, and I looked in the Classified Section and you are listed as Shipjoiners!"

r view of the new field store of Beth- Supply Company of California at Bakersfield.

A small portion of the crowd enjoying the "Open House" at the new Wilmington field store of Bethlehem Supply Company of California.

Exterior view of the new Wilmington field stor located at 1605 Santa Fe Avenue, Long Beach This store will serve the production and refinin activities in the harbor area.

Pacific MARINE REVIEW

OCTOBER, 1947

MORE FAMOUS PACIFIC COAST *House Flags*

Following its growth and achievements in war, the American Merchant Marine is now leading the world in the tremendous tasks of rebuilding. Among these leaders in trade and commerce are the organizations represented by these house flags, third in a series of Pacific Coast shipping companies. These firms, and maritime interests around the world, depend on General Petroleum, and other Socony-Vacuum Companies, for Gargoyle Marine Oils, and helpful lubrication service.

AMERICAN MAIL LINE

This flag's basic design was introduced by the late A. F. Haines, vice-president of the Admiral Oriental Line, predecessor to American Mail. It replaced the maltese cross of the original Admiral Line flag and is now well known as the stack insignia of American Mail Line vessels.

COASTWISE LINE

Blue for the Pacific, and white for the familiar breakers on its coastwise route mark the house flag of the Coastwise Line. Like many other noted house flags, this design was chosen for its simplicity, and is now flying on Coastwise ships between Los Angeles and Seattle.

SUDDEN & CHRISTENSON OVERSEAS CORPORATION

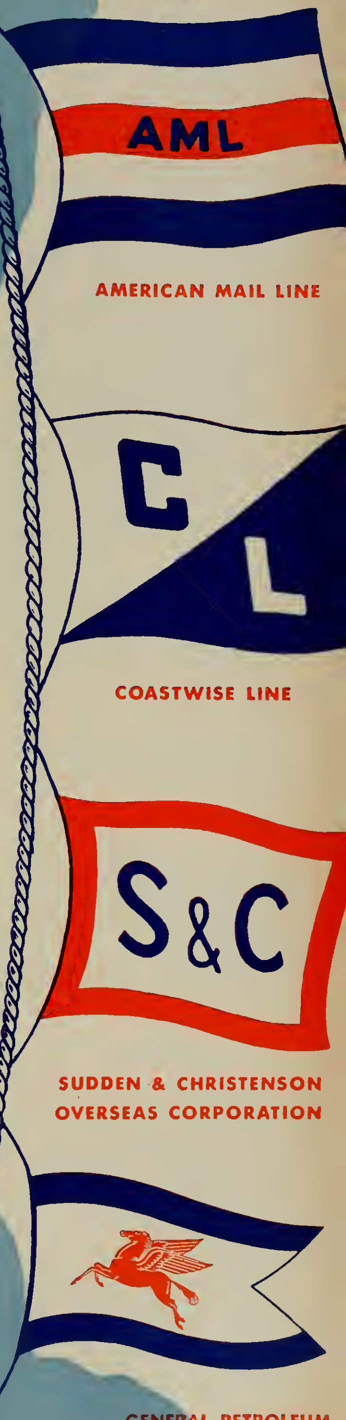
For forty-five years the S & C flag has been identified with offshore, coastwise and inter-coastal services of Sudden & Christenson, of San Francisco. The blue and white design, with its red border, was one of the first flown in inter-coastal service, long before the building of the Panama Canal.

SOCONY-VACUUM OIL CO., INC.

On its own fleet of tankers, and on marine service stations in virtually every part of the world, the Flying Red Horse of Socony-Vacuum and General Petroleum is closely associated with outstanding service and petroleum products. Deep water ships, coastal fishing vessels and all types of commercial and pleasure craft depend on Gargoyle Marine Oils and Lubricants. Obtainable in more than three hundred ports.

GENERAL PETROLEUM CORPORATION
(A Socony-Vacuum Company)

GARGOYLE
GARGOYLE Lubricants
MARINE OILS AND ENGINEERING SERVICE



GENERAL PETROLEUM CORPORATION
A Socony-Vacuum Company

MEN and ROPE

"Chuck" Di Lelio stacking bales of fiber in the Tubbs warehouse.

From the time you enter the fiber warehouses in the Tubbs mills (above) to the time when you see the great coils of finished rope ready for shipment — you are conscious of two things —

A fine product being formed during its every stage of manufacture.
MEN who contribute their seasoned "know how" to assure that the finished rope will measure up to most exacting standards.

It is this combination of MEN and ROPE that for nearly a century has made the Tubbs trademark stand for — not just another product — but the ***quality leader*** in its field.

Specify Tubbs Extra Superior Manila to your supplier for a rope easier to handle aboard ship, water and rot resistant, stronger and more dependable — in short — the outstanding ***rope value*** in the marine field.

TUBBS
EXTRA SUPERIOR MANILA
CORDAGE COMPANY

Reduce rope costs with SUPERCORE Manila Rope.
Available in sizes 6" circ. and larger.

- **SUPERCORE** lasts longer!
- **SUPERCORE** is tougher!
- **SUPERCORE** is stronger!
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Steady As You Go! By "The Skipper"

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A 12,500 MILE TANDEM TOW

. . . ON *Columbian!*

It's a long haul from Charleston to Manila Bay—12,500 grueling, hazardous, miles! That's the task of the tug Edward M. Grimm, with four converted mine sweepers in tandem behind her —a four months voyage that is perhaps the toughest ocean haul ever attempted.

For this herculean task a rope was needed. A tough, sinewy hawser that could be depended upon to resist the lashing strain of wind and sea while a powerful tug growled on, hauling a tow of 3000 feet.

The choice? Ten-inch Columbian Tape-Marked Pure Manila, in 90 fathom lengths!

Here is a rope, which like all Columbian Tape-Marked Pure Manila, is manufactured from only the choicest manila fibre. It has been proved in service, year in, year out, under all conditions. Where service conditions demand the best, it's Columbian Tape-Marked Pure Manila, with the Red, White and Blue surface markers.

There is no better rope.

COLUMBIAN ROPE COMPANY
400-90 GENESEE ST. AUBURN, N. Y.

Columbian PURE MANILA ROPE

LET'S LOOK AHEAD

Pacific Marine Review

THE SHIPS OF EXTREME ANTIQUITY were probably the raft and the hollowed log. Propulsion was by poles, then paddles and oars, then sail. We have come a long way since then, but, as a fellow we know says frequently, "not recently."

There is a fine record of progress during the war, as is usual in wars, and there are fine advancements in machinery and other parts of vessels and vessel facilities, but there is a lack of general acceptance of improvements by the whole industry. Individual shipowners seem to be unduly slow in adopting new features and lean to the traditional rather than to the new. It took upwards of a thousand years to get the sailing ship perfected just as steam propulsion began to cut away its prestige, while during the last century we have seen low and high pressure boilers, the turbine, the geared turbine, the electric drive, and the diesel.

There are many who claim that an alert industry ready and anxious to adopt evolutionary architecture, the most efficient of propulsion, adjustable pitch propellers, mechanical cargo handling, reduced pier transfers, and sea-air combinations could permanently dominate world sea traffic. One or another of these would increase efficiency on certain routes and the industry as a whole would get a lift.

But "the industry" is a term that many do not analyze. It includes not only ship operators, but shipbuilders; not only capital investment, but labor; not only shippers, but insurers; not only manufacturers, but government. And the Army and Navy. All of these and more! Their planning should be comprehensive and for the benefit of all. There are those in the industry who can bring this about.

Europe is bouncing back into a major place in shipping and we may not even be able to hold our share of cargo even when we donate it—in one form or another. And Europe is getting the types of ships best suited to the routes. In this respect at least Europe is looking ahead. Are we?

As this is being written, and one group of reports tells of new diesel vessels out of Britain, Sweeden, Norway, Italy, etc.; another set of figures shows two-thirds of the vessels entering San Francisco harbor on this date to be diesel, and a tabulation of 22 of the world's largest ships shows one-third of them diesel. But none of the above are American. We get to wondering about diesels, and while we wonder the announcement comes of successful trials of a gas turbine vessel in England. The Maritime Commission has been monkeying with a similar project for years, but successful trials are not yet in sight. Are we really looking ahead?

LET'S LOOK AHEAD!

PRESIDENT CLEVELAND AND PRESIDENT WILSON

Nearing completion at Bethlehem-Alameda yard for American President Lines. These beautiful ships will be the pride of the Pacific when placed in operation late this winter.

TOWBOAT FOR THE PORT OF PORTLAND, OREGON
The old Steamer Portland (in the background) and the new Steamer Portland, just after launching.

The Steamer Portland

THE NEW ALL-STEEL HULL stern-wheel towboat Portland was delivered by her builders, Northwest Marine Iron Works, to the Port of Portland on August 29. She will be used for towing big ships on the Columbia and Willamette Rivers.

This vessel has been built to replace the old wood hulled vessel of the same name, for many years a familiar feature of the Portland waterfront. The new *Portland* has a welded steel hull and main deckhouse, with a wood superstructure housing the cabins, texas, and pilothouse.

The vessel's primary function is to handle seagoing vessels in and about the Portland area waterfront, particularly through the bridges spanning the Willamette River. It also operates on the Columbia River towing vessels to and from Vancouver, Washington, and other Columbia River ports as far west as Astoria, Oregon.

A great deal of thought and consideration was given to the type and design of the vessel in view of its specialized service, which during flood conditions in the two rivers on which it operates, requires great flexability and power to handle large ocean vessels. Experienced river pilots were firm in their insistence that a steam-operated paddle-wheel type was the most desirable and their recommendations were followed by the Port of Portland Commission.

The preliminary design was by Guy Thayer of the Commission, under the direction of James Healy, the Port's chief engineer.

The vessel has been built under the rules and regulations of the U. S. Coast Guard (Marine Inspection Service), and the American Bureau of Shipping. The classification assigned is *A-1 River Towing Service, *AMS.

Hull

The hull is of all welded steel construction, butt welded. It is transversely framed forward from frames 0 to 19, and longitudinally framed from frames 19 to 93.

The keel plate is ⅜"x60" and extends full length of the vessel aft of frame 7. There is a forged steel forefoot 1½"x6½" in section. The transom is of 5/16 plate with 4"x3"x5/16" angle stiffeners. The transverse

At the "Portland" keel-laying ceremony at Gunderson Bros. plant, who were subcontractors for steel fabrication, on February 3, 1947. Left to right: Mrs. Ray Peterson, Joseph Grebe, Mrs. William Zavin, Mrs. Carl Donaugh, Harry Mendenhall, Mrs. Damon Trout, Carl Donaugh, James Healey, chief engineer, Port of Portland; John Doyle, secretary-manager, Port of Portland; Homer Shaver, commissioner, Port of Portland; Fred Peterson, commissioner, City of Portland; Al Gunderson, vice president, Gunderson Bros.; Damon Trout, Tom Larson, general superintendent, Gunderson Bros.

framing is of 4″x3″x¼″ angles and the longitudinal frames are of 4″x3″x5/16″ angles on 21″ centers.

Longitudinal girders are of 5/16″ flanged plate and are located 7 ft. and 14 ft. off center, port and starboard. Bilge stringers are 5″x3″x5/16″ angle.

Deck beams are 4″x3″ angle and deck stringers 6″, 10.5 lb. channel.

W. T. and/or O. T. bulkheads are located at frames 8, 19, 43, 53, 54, 63, 73 and 85. Bulkheads are of 5/16″ and ¼″ plate with 3″x2″ angle stiffeners in 24″ centers.

Fuel oil tanks are located between frames 8-19 and 43-53, feed water tanks between frames 54-63. Two independent potable water tanks are located in the wings, port and starboard.

Shell plating is of 5/16″ steel with a ⅜″ plate sheer strake, all butt welded.

Deck plating is ¼″, butt welded.

Two longitudinal trusses are located above the main deck extending from frame 19 aft to the stern wheel support. These trusses are built up of 8″ H-beams and 6″x4″ angles.

The engine girders are of ½″ plate and extend from the shell bottom to above the main deck and from frame 73 to the fantail girder.

12″ channels from the gunnel strake and are fitted with 4″x12″ inside guard timbers faced with 4″x12″ oak. A split pipe fender is provided 4 feet below the shear line.

DECKHOUSE: the main deckhouse extends from frame 19 to the transom and is an open area housing the boilers, main propulsion engines, auxiliaries, etc. Storerooms and washrooms are provided.

Walls are of 3/16″x5 lb. plating, overhead of 5 lb. plate. Two 5′6″x8′6″ steel sliding doors are located on the forward end and two 8′6″x8′6″ amidships port and starboard.

CABIN DECKHOUSE: the cabin deckhouse, extending from frame 19½ to 73½ is of tongue and groove wood construction. This cabin houses the berthing, messing and lounging quarters for the crew. A lounge space is located at the forward end fitted with tables, settees, etc. Aft of this space are staterooms for thirteen persons in single and double spaces each fitted with steel lockers, washbasins, built-in bunks. Washroom, bath and toilet facilities are also in this cabin. Aft of the berthing space is the mess, seating 16 persons at two tables. The galley is located aft of the mess and is fully equipped with all necessary facilities, including oil burning range, stainless steel sinks and dressers.

In separate houses aft of the galley are located the refrigerator and ice-storage space and the galley dry storeroom.

All interior spaces are covered with battleship linoleum.

TEXAS DECKHOUSE: the Texas deckhouse contains berthing space for the Captain, Mate, Pilot and a spare. The exterior deck is of T & G construction covered with canvas, interior deck covering of linoleum.

PILOTHOUSE: the pilothouse is located above the Texas deckhouse and is approximately 11 feet x 13 feet. In it are located the hand and power steering wheels, engine room telegraph, bell-pulls, chart table and navi-

The vessel has the following characteristics:

Length, stern to transom	186	ft.,	0	inches
Length, overall	219	ft.,	0	inches
Breadth, molded	42	ft.,	0	inches
Depth, molded, at shear line	9	ft.,	0	inches
Shear, forward	3	ft.,	10½	inches
Shear, at transom	2	ft.,	1	inch
Camber	0	ft.,	9	inches
Designed mean draft, light	5	ft.,	3	inches
Designed mean draft, full load	5	ft.,	6	inches
Gross tonnage	928	tons		
Net tonnage	733	tons		
Fuel Oil Capacity	133	tons		
Feed water capacity	80	tons		
Potable water capacity	2	tons		

gating equipment. Full vision is provided on all four sides of the pilothouse by large windows.

Machinery

STEAM PLANT: There are two oil-fired, cross drum type, sectional header, Babcock and Wilcox boilers, each having a steam capacity of 22,000 lbs. hr. at 250 psi using feed water supplied at 200 deg. F. Each boiler is fitted with three Babcock and Wilcox Decagon C.D.D.F. straight mechanical atomizing oil burners. Each boiler is equipped with Diamond soot blowers and L. J. Wing turbo-blowers for induced draft. A Reliance "Eye-Hye" remote reading water level indicator is provided for each boiler aft at the engineer's station.

A unit-type fuel oil plant is located on the boiler flat consisting of 2 Worthington Duplex pumps, Coen-Multifilm heaters and twin suction and discharge strainers. Full transfer is provided between oil tanks and each tank is equipped with a "Levelometer" remote reading gage.

Below: Left to right: Earl Riley, mayor, City of Portland; Mrs. William Zavin, sponsor and daughter of Joseph Grebe, president, Northwest Marine Iron Works, (standing next to her); Mrs. Ray Peterson, matron of honor, and daughter of Joseph Grebe; and E. F. Doyle, vice president, Port of Portland Commission.

Above: Left to right: Mrs. George Goodell, wife of the assistant local manager, U. S. Maritime Commission, Maintenance & Repair Division; Mrs. H. R. Mendenhall, wife of the secretary-treasurer of Northwest Marine Iron Works; Mrs. R. E. Fatherree, wife of the assistant secretary-treasurer, Northwest Marine Iron Works; Mrs. Damon Trout, wife of the president of Marine Electric Co., Portland, Mrs. Ray Peterson, matron of honor, Mrs. William Zavin, sponsor, and Joseph Grebe, president, Northwest Marine Iron Works.

Harry Mendenhall, secretary and treasurer, Northwest Marine Iron Works, making address at launching of Steamer Portland, May 24, 1947.

Feed water is supplied by two horizontal end-packed pot valve plunger type duplex pumps, drawing water from the feed tanks or direct from the river. Three Renauld heaters are provided each having a capacity of 22,000 lbs. hr. at 200 deg. F. Steam to the heaters is provided from by-passed exhaust lines of the main and auxiliary systems. Each boiler is fitted with a Copes feedwater system and each pump has a Copes regulator.

Main Engines

The propelling machinery consists of two sets of single cylinder, horizontal, non-condensing, reversing steam engines, operating at 235 psi. The engines are located aft in the main deck and drive two steel pitmans connected to the paddle wheel. The engines were designed and built by the Northwest Marine Iron Works.

Each cylinder has a bore of 26″ and a stroke of 108″. Valves are of the piston type and are adjustable as to points of admission, exhaust, compression and cut-off. The cut-off valve is variable over the range from one-quarter to full stroke. The valves are operated through eccentrics located inside the deckhouse and driven by an arm actuated by the pitmans. Link reversing gear is used.

Pitmans are of welded steel, box-girder design, fitted with forged steel ends and u-straps. Bearings are of cast bronze fitted with taper keys. Each pitman is 36 feet long with a crosshead bearing 7″ diameter and a crank bearing 9″ diameter.

All operating levers are conveniently banked at the engineers station and consist of the main throttle, manual cut-off, manual reverse and power reverse. The power reverse is a single cylinder steam ram fitted with a compensating valve gear. All tumbler shafts are located below the main deck.

The main throttle valve is of the semi-rotary type fitted with a pilot valve.

The crankshaft is of forged alloy steel, hollow bored, 15½″ diameter 30′6″ long. Forged steel cranks having a 54″ throw are located at each end fitted with nickel steel shrunk in pins. Five wheel hubs are located in the shaft, each 6 ft. diameter. The shaft operates in two large pillow blocks located on the engine girders.

The paddle wheel is of wood construction 25 ft. diameter, 26 ft. wide. There are 20 buckets each 3 ft. wide.

Auxiliary Machinery

The vessel is equipped with a Markey twin cylinder drum type steering engine with pilothouse control actuating the rudders through an 80 degree arc. There are four main rudders and three monkey rudders connected to the steering engine through a system of connecting links, quadrant, and wire rope. Rudders are of wood construction, balanced, and are mounted of forged steel stocks with provision to ship or unship without docking. A six foot auxiliary steering wheel is located in the pilothouse.

Four double drum friction operated reversing steam winches are provided for handling lines. Two are located on the open forward main deck and two amidships in the main deckhouse. Winch cylinders are 7″x12″ with piston valves and fitted with a reversing valve. Each drum has a capacity of 1475 feet of ⅞″ wire rope with a designed line pull of 20,000 lbs. Each winch is provided with a heavy duty full swiveling fairlead mounted on a separate foundation. Winches and fairleads were designed and built by the Northwest Marine Iron Works.

A fire and general service pump is located on the main deck and hydrants and hose connections in the main, cabin, and texas decks. This pump is connected to draw water from the bilge or aft sea well, and to discharge overboard, to the fire lines, or to the feed water tanks.

A potable water pump is located in the main deck, drawing water from the tanks and discharging through both hot and cold water lines to the galley, staterooms, bath and washrooms.

A sanitary pump is provided to draw water from the aft sea well and discharge to the sanitary system. All pumps are equipped with governors.

Steam syphons are located in each hull compartment. Steam smothering lines are located in the hull lamp and oil lockers.

A fifty gallon hot water tank is installed, steam heated with thermostate control.

Electrical Systems

Power is provided by a steam engine driven generator, direct current, self-excited, two-wire compound wound 120 volt 15 kw capacity.

A dead-front switchboard is provided mounting all the necessary busses, controls, etc., and is arranged to utilize ac current from shore when tied up. A standby generator, steam-driven turbine type, is also installed to provide current for the engine room telegraph and some lights in the event of the main plant being shut down. Four panelboards are located throughout for current distribution.

A 1000 watt pilothouse controlled searchlight is mounted on the pilothouse roof and four large flood lights are located on the cabin deck fore and aft.

The fire alarm system is of the electric bell type.

Sound powered telephones are located in the pilothouse, the boiler room, and at the engineers station.

A repeat-back electrically operated engine room telegraph is provided; also a trip gong and jingle bell system.

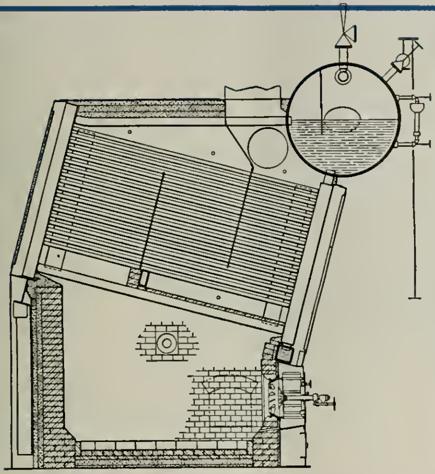
Miscellaneous

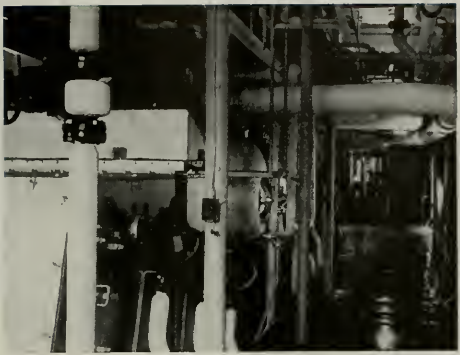
The vessel is equipped with a life boat and a work boat both hung on davits and mounted in cradles on the cabin deck aft.

All necessary navigational and safety equipment is provided, including clocks, 8″ compass, fog bell and horn, anchor, firehose, life buoys, etc.

Following is a list of the principal items of equipment or services and the companies which were represented:

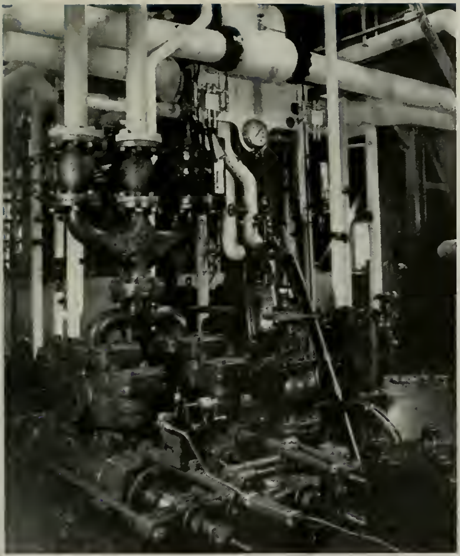
Hull design, W. C. Nickum and Sons, Seattle, Washington.
Machinery design, Sam H. Shaver, consultant.
Steel fabricators, Gunderson Bros. Engineering Corp., Portland, Oregon.
Boilers, soot blowers, turbo-blowers, Copes feedwater system, Reliance "Eye-Hye" system: by C. C. Moore and Co., representing Babcock and Wilcox.
Steering engine, Markey Machinery Co., Seattle, Washington.
Clocks and compass, Frank H. Parks, Portland, Oregon.
Fire extinguishers, axes, etc., AAAA Fire Extinguisher Service, Portland, Oregon.
Interior deck coverings, Portland Linoleum Co., Portland, Oregon.
Plumbing fixtures, lavatories, hot water tank, etc., Consolidated Supply Co., and Peerless Pacific Co., Portland, Oregon.
Main feed pumps, fire pump, sanitary pump and potable water pump, Brod and McClung, representing Dean Bros. Co., Indianapolis, Ind.
Deck winch cylinder assemblies, Helser Machine and Marine Works, Portland, Oregon, representing American Hoist and Derrick Co.
Canvas deck covering, Hirsch-Weis Canvas Products Co., Portland, Oregon.
Furniture and cabinet work, Nicolai-Neppach Co. and Western Door and Plywood Co., Portland, Oregon.
Feed water heaters, W. G. Ballantyne Co., representing the Renauld Company of Los Angeles, California.
Fuel oil plant, V. S. Jenkins Co., Seattle, Washington.
Hardware and miscellaneous, Marshall-Wells, Woodbury Co., and J. E. Haseltine Company, Portland, Oregon.
Convector radiators and fittings, Consolidated Supply Co., Portland, Oregon.
Oil and water tank gages, Liquidometer Corp.
Main engine castings, Western Foundry Co., Western Steel Casting Co., Central Brass Foundry Co., Portland, Oregon.
Main engine forgings, Ray Smythe representing Heppenstal Co., and Monarch Forge and Machine Works, Portland, Oregon.
Piston rings, Ray Smythe, representing Koppers Co.
Alloy steels, Pacific Machinery and Tool Steel Co., Portland, Oregon.
Metallic steam packing, W. J. Robbins, Portland, Oregon.
Pipe bending, Albina Pipe Bending Co., Portland, Oregon.
Steam separator, Brod and McClung, representing Swarthout Co.





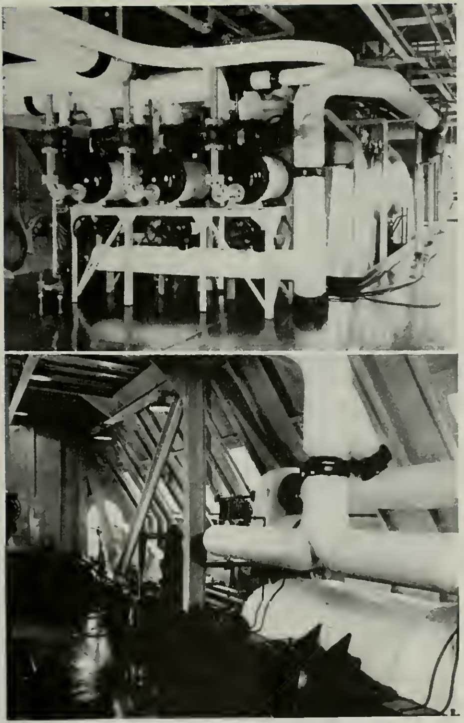
Above: From the main deck, port, looking aft can be seen the two B & W boilers that power the Portland.

◀ Cross-sectional view of one of the two B & W sectional-header, three-pass boilers that have a design pressure of 250 psi, and capable of delivering 22,000 pounds of saturated steam per hour at 235 psi.



Above: Engineer's Station, main deck aft, showing Dean Bros. feedwater pump in foreground, manual and power reverse gear alongside and Marine Electric Co's. "Gault" steam-driven generator in background.

At right: Babcock and Wilcox boilers on the Portland. Main deck looking forward, showing Renauld feedwater heaters. Main deck looking aft, showing port engine.



The steamer Portland, built by the Northwest Marine Iron Works, was recently delivered to its owners, the Port of Portland Commission. She will be used for shifting large sea vessels in and about the Portland area waterfront, particularly through the bridges spanning the Willamette River. She will also operate on the Columbia River towing vessels to and from Vancouver, Washington.

Steam syphon and injectors, Brod and McClung, representing Schutte and Koerting.

Desks and chairs, Smith Bros, office outfitters, Portland, Oregon.

Navigational equipment and marine supplies, Beebe and Company, and Marden and Hagist, Portland, Oregon.

Lumber, Dwyer Lumber Co., Aaron Bros. planing mills and Enterprise planing mills, Portland, Oregon.

Paints, W. P. Fuller & Co., Portland, Oregon.

Turbo-generator, M. F. Brady Equipment Co., representing Pyle-National Company.

Packing, Garlock Packing Co., and Anchor Packing Co.

Life and work boats, Tregoning Co., Seattle, Washington.

Rudder stock forgings, Isaacson Iron Works, Seattle, Washington and Monarch Forge and Machine Works, Portland, Oregon.

Fire hose, Goodyear Rubber and Asbestos Co., Portland, Oregon.

Electrical installation, steam generator, engine room telegraph, switchboard, panelboards, searchlight, lighting fixtures, etc., Marine Electric Co., Portland, Oregon.

Insulation and pipe covering, Asbestos Supply Co., Portland, Oregon.

Wire rope, J. A. Roebling & Sons, Portland, Oregon.

The following is the chronological record of vessel's construction:

Start of plan preparation	September 4, 1946
Start of loft work	October 1, 1946
Start of shop fabrication	November 17, 1946
Keel laid	February 3, 1947
Launching	May 24, 1947
Builders trial	August 15, 1947
Official trial	August 23, 1947
Delivery	August 29, 1947

PHOTOGRAPHING A SHIP

A group of G.I.'s from the Photographic Center of the U. S. Signal Corps in Long Island City, go to unusual lengths to acquire interesting shots of activities at the Todd Shipyards Corporation Brooklyn Division. This was their interesting assignment as part of their 17 weeks course at the Signal Corps School of Photography, and it is apparent the boys are at home with their news cameras. The two upper figures on the ladder of a 34-ton crane, are ex-Navy men which explains their striking poses. In command of the unit is Captain Herbert M. Ware, of Boston, Mass.

Photo by Todd official photographer

REPORT ON SHIP SALES ACT

By Vice Admiral WILLIAM W. SMITH, USN, Ret.
Chairman, United States Maritime Commission

(There has been some misinformation in circulation regarding the progress of the Maritime Commission under the Ship Sales Act. Admiral Smith's report, prepared for Pacific Marine Review, outlines the results to date. ED.)

THROUGH ITS ADMINISTRATION of the Merchant Ship Sales Act of 1946 the Maritime Commission is effecting an important step toward realization of the objectives of the Merchant Marine Act of 1936 for a well-balanced American Merchant Marine under private ownership and operation. Transfer of vessels of the war fleet to private hands represents much more than the mere disposal of surplus government property. It represents an effort on the part of the government to place American flag services in a strong postwar competitive position in offshore trades by supplying our operators with the finest ships available from the war-built tonnage.

Neither the Maritime Commission nor anyone familiar with our national maritime requirements believes, of course, that the American Merchant Marine can exist in the future with vessels it can glean from an already well-picked-over residue of aging wartime bottoms. We don't expect our other industries to carry on from year to year without replacements and modernization of their plants; nor, from the national defense standpoint, do we expect the Army, the Navy or the Air Forces to equip themselves with the leftovers from a previous war.

The Merchant Marine, which is both an industry and an arm of our national defense structure, must also have replacements which will keep it modern and strong. That was the original intent of the Merchant Marine Act of 1936: to provide American flag services with the quality and the types of vessels required to enable them to compete with foreign flag services, and to eliminate the disabling consequences of the dry rot of obsolescence. To this end the Maritime Commission has placed strong recommendations before the President's Advisory Committee on the Merchant Marine for a long range program of new construction and betterments, endeavoring to initiate anew a building schedule for rehabilitation of the Merchant Marine such as that started in 1937, which was submerged in 1939 by the mass production requirements of the war.

It is sincerely hoped by the Commission that a long range building program will receive early approval to meet not only the needs of the Merchant Marine but also the needs of our American shipbuilding industry which now is threatened with practical extinction. But in the meantime our shipping requirements have been well met through the program for disposal of the war-built fleet during the immediate postwar period. The result has been that, in the offshore cargo field, we are even somewhat better off as to types and tonnage of vessels than we were before the war. The same cannot be said, of course, for the passenger field, and passenger ships remain the chief need of the American Merchant Marine. As to domestic shipping, this field presents a special problem that is not connected with the availability of bottoms, but is due rather to the situation respecting rates which can be adjudicated only by the Interstate Commerce Commission, except for the argument advanced from some quarters in recent months that federal operating subsidies should be allowed to domestic carriers.

Congress, in enacting the Merchant Ship Sales Act of 1946, and the Maritime Commission, in administering it, have had clearly in mind the needs of the American Merchant Marine over those of its foreign competitors. Americans have preference under the Act, and they have received preference. The criticism has frequently been heard that the Commission has sold a larger number of ships to foreigners than to Americans. This is true, but it must be remembered that by far the largest proportion of the best types of ships have gone to Americans, while the larger number sold to foreigners have consisted principally of the less desirable types. Moreover, Americans have had the privilege of chartering ships from the war fleet, a provision of the Act which has proved of very great assistance in the restoration of American shipping to private operation.

There were originally 4000 or more ships available for disposal under the Merchant Ship Sales Act. As of June 30, last, the Commission had approved the sale of 1385 of these ships, representing revenue to the

Federal Treasury totaling $1,150,000,000. In addition, 1510 vessels had been allocated for charter, bringing in revenue of $250,000,000. Except for 247 tankers, 58 dry cargo vessels and 10 emergency vessels still operating for government account, the remainder were immobilized.

At this stage of the business of surplus ship sales it is interesting to examine the record to see who got what. Among the original fleet of 4000 ships available for sale under the Act there were 200 of the choice C-2 and C-3 types, the large, fast cargo liners which were the best of the ships built during the war. As of June 30 nearly all of these 200 ships had been sold or allocated for sale to American shipping companies. Of the 155 C-2 vessels available for sale, 121 have been sold to American operators and 6 to foreign purchasers. The remaining 28 included 14 fully refrigerated vessels and 14 military type ships which have thus far found no market. Of the 88 C-3 type originally available, every last one has been sold or allocated to Americans. Thus there have been 209 superb cargo vessels added to the privately-owned and operated postwar American Merchant Marine.

Other types approved by the Commission for sale to American operators totaled, as of June 30: C-1, 15; Victory, 6; standard Liberty, 81; Liberty Collier, 23; Liberty tanker, 2; large fast tanker, 82; coastal tanker, 2; smaller coastal vessel, 7; ocean-going barge, 13.

This makes a total of 440 vessels sold American. The Commission is frankly disappointed in the number of Victory ships purchased by American companies, but it is assumed that the Victorys have been passed over in many cases in favor of the more desirable C-2 type. More Libertys were bought by Americans than had been anticipated, on the other hand.

Under its foreign policy the United States has been committed to aiding our wartime Allies and friendly nations in the rehabilitation of their merchant shipping. Countries like Great Britain, France, Holland and the Scandanavian group suffered severe depletion of their merchant fleets during the war. Therefore, Congress authorized, in the Ship Sales Act, that ships of our war-built fleet be sold to foreign governments and their nationals after preference had been given to American operators. As of June 30, 945 ships had been sold or allocated for sale foreign.

More than 60 per cent of the ships sold foreign have been Libertys, classed as slow tramp tonnage. Also included were 91 Victorys and 121 coastal dry cargo vessels. Forty-three C-1 vessels, and only 6 C-2's were sold foreign. No C-3 or C-4 types were included in foreign sales. Included were 101 T-2 tankers and 5 coastal tankers.

To recapitulate, foreign purchasers have been sold or allocated 834 dry cargo vessels (comprising 49 C types,* 121 coastal vessels, 573 Libertys and 91 Victorys), and 106 tankers.

At the conclusion of the quarter ending June 30, the Commission had before it 307 applications for the purchase of 712 vessels, 63 for American flag and 649 for foreign flag operation. A small portion of the foreign applications may receive approval, and any additional ships thus sold will be almost entirely Libertys and tankers. It is expected, however, that most of the American applications now on hand will be approved, and that additional American applications will be filed and approved during the remainder of the life of the Ship Sales Act.

By the close of the last quarter 84 American steamship companies had chartered 1510 vessels, including 130 C types, 1073 Libertys, 8 passenger ships, 21 reefers, 265 Victorys, and 3 N-3's. This heavy demand for chartering has been maintained despite a substantial increase in foreign flag carrying of coal, grain and other foreign rehabilitation cargoes. Most of the Libertys were chartered for the bulk cargo trades, primarily coal and grain, and of the total of ships chartered, about 75 per cent were engaged in what might be termed tramp operations.

Despite the unfavorable freight rate conditions in the domestic trades, private operators have ventured back into these trades with the termination of government operation. The 38 vessels previously operated under GAA in the intercoastal trade, and 5 in the Pacific coastwise trade were made available for charter at the termination of general agency agreements.

The Merchant Ship Sales Act, extended to March 1, 1948 by Congress at its last session, provides that ships of the war-built fleet not sold by that date (including those on charter) shall be preserved in the national defense reserve fleet. The reserve fleet has fluctuated a good deal in size during the active period of sales and chartering under the Act. There have been as many as 2348 vessels in reserve, and 1146 have been withdrawn for sale, charter, GAA operation, or scrapping from time to time. As of the end of the quarter, June 30, the reserve fleet contained about 1200 vessels, including more than 900 in the permanent reserve anchorages and nearly 300 in the temporary anchorages. Of the 1200, approximately 1020 were war-built. The permanent reserve fleet will become more stable when the sales and chartering program is over.

Operation of the Merchant Ship Sales Act of 1946 has given the American Merchant Marine a good start in the postwar period, while helping our Allies and friendly nations to rehabilitate themselves in the consequences of the recent war. This program, however, is only temporary, and the real need of American flag shipping is for a sound, long range program of new construction and betterments such as the Maritime Commission has recommended.

Our wheels are turning; it must be our objective to keep them turning.

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* Five additional C-2 vessels approved for sale by the Commission were rejected by the applicants because of excessive repair and reconversion costs.

BETHLEHEM RIGS THE SAINTE HELENE

By E. A. BERGERON, Foreman

Rigging Department, Bethlehem Steel Company, Shipbuilding Division, San Francisco Yard

The Sainte Helena shortly after her arrival at Bethlehem's San Francisco Yard.

BETHLEHEM'S SAN FRANCISCO YARD has just successfully completed the largest rigging job to be performed on a commercial vessel on the Pacific Coast since the war, and the largest ever undertaken by this yard. 17,558 feet of wire rope, 15,733 feet of it made by Bethlehem, and ranging from ¾″ to 1⅞″ in diameter, was used for the mast shrouds and preventers, the vang pendants, vang purchases, falls and topping lifts on the M. V. *Sainte Helene,* a 320-ft. C1-M-AV1 coastal motorship, recently purchased from lay-up by the French Government. She will be operated by the French firm of Daher & Company, to transport railroad locomotives and cars from France to that country's African colonies.

E. A. Bergeron, rigger foreman at Bethlehem's San Francisco Yard, is a native of New Orleans, La. At 17 he enlisted in the Navy, where he spent eight years. He came to Bethlehem in 1940 as a rigger. In 1941 he was made a leaderman, and a year later a supervisor. He was appointed to his present position in September, 1945.

Originally the *Gwinnett,* the *Sainte Helene* was built in Superior, Wisconsin in 1945. She has a beam of 50 feet and a 29-foot depth.

To provide means for loading and unloading the heavy railroad rolling stock, the yard fabricated two booms of 65-ton capacity each—one for the aft end of No. 2 hatch and the other for the forward end of No. 3 hatch. Each of these is 60 feet long, 24 inches in diameter and was fabricated from ⅞″ steel plate.

Part of the job called for extending and strengthening the mainmast to enable it to withstand the powerful forces exerted upon it by the 65-ton boom load. Therefore, the mast was removed, lengthened 10 feet and fitted with necessary doublers, new stay pads and topping lift swivels. The hull under the mast was strengthened and new boom steps fabricated. Longitudinal doubler butts and all boom butts were welded mechanically to obtain a perfect bond. Eight specially constructed 7-sheave blocks 24″ in diameter were then installed on the topping lifts and cargo falls. Two 39-foot strongbacks, designed and fabricated by Bethlehem were installed on the block at the end of each cargo fall to facilitate maneuvering of locomotives and cars when loading or unloading.

In addition to the large job of rigging the *Sainte*

At left: The Ste. Helene's mast, shown in the background in the above photo, was lengthened 10′, fitted with necessary doubler, new stay pads and topping lift swivels. One of the vessel's two 60′ booms is shown in the foreground being fabricated.

Center: A 7½-ton boom being raised from wharf at start of stepping operation.

At end: Boom, in midair over hatch, being lowered to gooseneck.

At right: Fitting boom to gooseneck. Note 5½″ diameter pin.

Helene's 65-ton booms, which required additional shrouds and preventer stays on the mainmast, the yard completely renewed the wire rope rigging for ten 5-ton booms and two 3-ton booms.

Bethlehem's job on the *Sainte Helene* did not end here, however. The ship was also drydocked for routine underwater repairs. Her tailshaft was drawn and a new one, constructed by the yard, installed. Her crew's quarters were redistributed in what amounted to a considerable conversion job in itself. The vessel's main and auxiliary engines were overhauled. Fuel oil and water piping in the engine rooms was altered and refrigeration equipment repaired. In addition, new life boats, lifeboat equipment, radio and a radio direction finder were put in.

Coming back to the *Sainte Helene's* rigging, I would like to state in conclusion that successful operation of the *Sainte Helene's* new hoisting equipment, which was borne out in thorough operational tests with 10 per cent over-loads, is due to the exacting engineering work performed by the yard's drafting department which designed the entire job.

One of two strongbacks for the Ste. Helene under construction in Bethlehem's fabricating shops. These are to carry locomotives aboard the vessel.

BLOCKS ON THE SAINTE HELENE

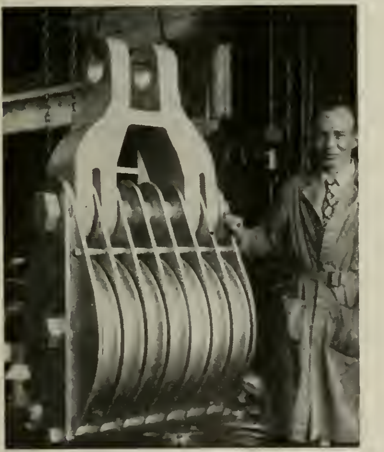
In the above article reference is made to topping lift and cargo fall blocks. The picture shows one of the 65 ton blocks manufactured by Alvin R. Campbell Co., Inc., San Francisco.

The block shown on opposite page is the type used on

From left to right: A load of 71.5 long tons has been lifted from the wharf by ship's boom and is being hoisted inboard by forward offshore vang. Second from left: Test load outboard on port side. Vessel is listing at approximately 5°. Third from left: Test load on center line being lowered into hold. Last view: Test load at rest on bottom of hold.

the topping lift and upper cargo falls, weighs approximately 3400 lbs., has seven 24″ diameter cast steel sheaves with non-adjustable Timken Roller Bearings, 3″ diameter precision ground center pin with double end lubrication. These are so made as to be interchangeable.

The extended yolk is forged steel SAE 1040 annealed, with a 4″ diameter bolt at block end and drilled for a 4½″ bolt for connecting with boom head and mast swivel.



This gives the relative size of the topping lift and upper cargo fall V blocks used on the Ste. Helene.

Tolerance between center pin and bearing is .002 maximum.

Bearing selection was made according to method for calculating crown and traveling blocks as recommended by Timken Roller Bearing Co. Calculations were based on a maximum operational speed of 75 rpm.

The block is completely galvanized except for center pin and bearings. The cost alone of the galvanizing was $110 per block.

The designed factor of safety is 5, and though not shop tested, the blocks have a maximum much greater. The lower hoisting block was a weighted type with 450 lbs. of cast iron galvanized cheek weights on each side. In place of the forged yoke, the block was fitted with special clevis type forged all galvanized 5″ anchor shackle.

Globe Wireless Opens Hong Kong Service

Globe Wireless Ltd. have opened service to Hong Kong, China. To reach this British Colony messages are sent from San Francisco over Globe's highspeed radiotype circuit to Manila and then transferred to Eastern Extension Cable Co. for delivery in Hong Kong.

This is another step forward in the huge expansion program Globe Wireless is planning for the Far East, including service to other Oriental countries as soon as the volume of American trade warrants rapid, efficient radiotelegraph service with the United States.

There is no direct radio circuit between Hong Kong and the United States, although under the terms of the Bermuda Agreement the British agreed that eventually one direct circuit would be permitted. Authorities in Hong Kong do not consider that commercial plans have progressed to the point where a direct circuit would be feasible, therefore, American communication companies are relaying their messages through Manila.

THE PRESIDENT'S ADVISORY BOARD

IN SEPTEMBER PACIFIC MARINE REVIEW the statement of American shipowners before the President's Advisory Committee was briefly reviewed. Similarly, a digest of the statement of Frazer Bailey, president of the National Federation of American Shipping, is presented here. Next month certain heads of operating companies will be quoted. Ed.

Obstacles To American Shipping

Unquestionably there arises in the minds of the Committee, and probably in the minds of the general public, the question why the shipping industry is in its present state of difficulty.

In order to partially clarify this, we feel that we should state some of *the obstacles which confront American shipping from time to time* and in various trades.

1st. Not only are wages at a very high level but man-hour production is very low. Further, the many interruptions of shipping due to labor strikes have resulted in lack of confidence on the part of shippers where competing forms of transportation exists, and the waterlines are not favored with the business where reliable deliveries are of great importance.

2nd. There exist in numerous trades *discriminatory* and prejudicial *trade barriers and restrictive practices* which redound to the benefit of the foreign competing line. These are perhaps of a minor character, but cumulatively they are a burden, and at times affect the relative cost of overall delivery and competitive routing.

3rd. There is always the uncertainty that due to some change in policy, or other conditions, the Government with a large reserve fleet may possibly decide to dispose of some of this tonnage (under pressure of some character) upon more favorable terms of sale or charter to other shipowners for competing operation with those who have substantial private investments. True, the Ship Sales Act provides for freezing certain vessels in the laid-up fleet after a given date but when capital investments reach such large amounts, the fear of such a possible occurrence cannot be avoided; in fact, the Maritime Commission already has recommended that the freezing date originally provided in the Ship Sales Act be extended 18 months.

4th. In the international trades there is danger that the United States will sell to non-citizens an excessive number of vessels which, when manned with low-wage foreign crews, will have a substantial competitive advantage. It should be remembered that there is only a certain amount of this international business, and to the extent that non-citizens with lower operating costs enter the field, the American-flag carrier is likely to be deprived.

5th. Will the railroads be permitted to continue non-compensatory rates in competition with coastwise and intercoastal water carriers as already referred to?

6th. Will the American shipping lines continue to be deprived of the opportunity of adding *air service* to and over their existing routes? This refers primarily to passenger service where air transport can be used to great advantage as part of an overall transportation system.

7th. Multiplicity of Government agencies administering laws and regulations relating to shipping:

As to the last two items, Sea-air and Multiplicity of Government Agencies, we ask your indulgence to amplify.

Multiplicity of Government Agencies

One of the handicaps confronting shipping is the necessity of dealing with a great number of Government agencies, administering the laws and regulations which relate to the operation of ships. The shipping industry can understand the necessity for reasonable governmental regulation on account of the character of the business involved. It would not seem necessary, however, to require that 52 separate Government agencies be involved in administering these laws and regulations.

Urgency of Action

We suggest for your consideration that speed is of the essence. As far as the shipowners are able to ascertain, construction contracts for merchant vessels in the yards of American shipbuilders will be practically completed by the end of the present year, and any which survive this period will be completed in the first quarter of 1948. The shipowners are interested in the preservation of American shipbuilding facilities. These constitute the source of the equipment with which we carry on our business. The recommendations which we have made in many instances require Congressional action, and Congress will adjourn under the terms of the Reorganization Act not later than July 30 and probably by July 20. It will not reconvene until January. If, therefore, remedial legislative action is to be taken, it must be initiated almost immediately. We very respectfully suggest that this phase of the subject receive your preferred attention through a preliminary report and recommendations, or such other means as may please the Committee.

Summary of Recommendations

1. The construction differential subsidy to be fixed at the maximum amount now permitted by law, namely 50 per cent of the American construction cost.
2. Construction differential subsidy be extended to the building of ships for domestic trades.
3. That Congress amend the ICC Act to prevent unfair competition by rail and truck lines with water lines offering for the same traffic.
4. Construction differential subsidy to be extended to conversions and reconversions.
5. All trading restrictions now provided for vessels receiving this type of Government aid to be removed, except that the

(Please turn to page 110)

REPAIRS TO WELDED SHIP HULLS

By E. C. RECHTIN, Manager, San Pedro Yard,

Bethlehem Steel Company Shipbuilding Division

PART II

WE HAVE DISCUSSED and shown the causes of several typical failures of welded ships in Part I and have pointed out their prime faults of design and construction, as well as the methods which can be used to avoid these difficulties.

On a vessel which has already been built and which may possibly contain some of the faults, it is necessary to make certain modifications to eliminate the possibility of serious fracture. The most commonly adopted method is the insertion of partial riveting or so called crack arresters.

The Maritime Commission together with the Coast Guard and the American Bureau of Shipping have developed a satisfactory program to correct these deficiencies in Liberty ships. The program consists principally in the elimination of all square corners, the modification of hatch corners, and the provision of crack arresters in the form of riveted joints in deck or sheer strake. Corrections to bilge keels and gunwale connections were also made. Most of the Liberty ships now afloat have been so treated to remedy their defects or were built in yards where new procedures resulting from this investigation were in effect, but a purchaser should satisfy himself that this work actually has been done on any vessel in which he is interested. Where riveted gunwale angles, or straps are used it is important to remember that these may be highly stressed and that the old-time rules and practices for good riveting still apply here.

There has been, however, until very recently, no really recognized procedure on the T-2 tankers. The American Bureau has now issued instructions for the installation of crack arresters. Some of these vessels have already been treated; others have had no serious structural trouble even without treatment. Operators, however, are concerned by major failures that are occurring on tankers of this type.

Seventeen T-2 tankers have experienced major structural failures,—that is cracks extending twenty feet or more into the main longitudinal strength members of the ship. Five of these ships broke completely in two and the others might well have done so under less favorable conditions. Although these 17 major failures constitute only a little over 3 per cent of the total T-2 tankers built, the danger is serious enough to warrant taking some measures to prevent its occurrence on other

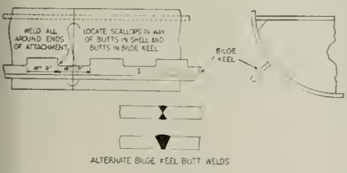


FIGURE 5-B

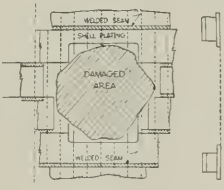
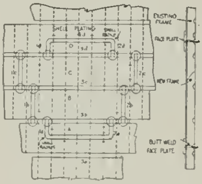


FIGURE 7



○ ENDS OF BUTT WELDS FINISHED FULL AND CHIPPED CLEAN BEFORE WELDING SEAMS

FIGURE 8

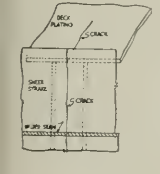


FIGURE 10

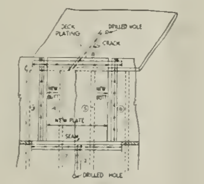


FIGURE 10 A

O ARROWS DENOTE GENERAL DIRECTION OF WELDING. SHORT ARROWS DENOTE DIRECTION OF OSITING WELDS.

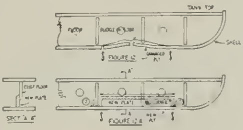


FIGURE 13 B

LONG ARROWS DENOTE GENERAL DIRECTION OF WELDING. SHORT ARROWS DENOTE DIRECTION OF DEPOSITING WELDS.

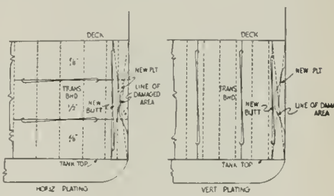


FIGURE 15

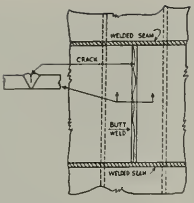


FIGURE 1

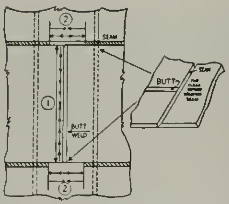


FIGURE 1-A

LONG ARROWS DENOTE GENERAL DIRECTION OF WELDING, SHORT ARROWS DENOTE DIRECTION OF DEPOSITING WELDS.

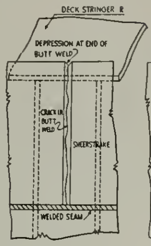


FIGURE 2

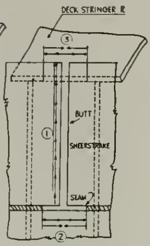


FIGURE 2-A

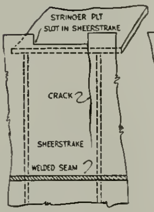


FIGURE 4

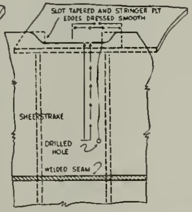


FIGURE 4 A

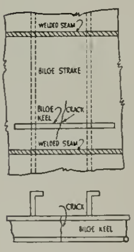


FIGURE 5

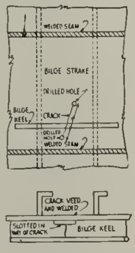


FIGURE 5-A

ships of the class. The procedure advocated by the American Bureau should provide a remedy.

Most of the cracks start in the bottom shell and bilges amidships but a few have started in the deck also. The exact location of the start of the crack is unpredictable, although it is usually in a faulty weld, in a notch, or discontinuity in the structure, or in a combination of the two. As there are an immense number of such potential cracks, it is impracticable to inspect and repair all of them, and even if this could be done, subsequent damage and normal repairs would introduce new possibilities. The soundest thing to do under the circumstances is to provide means to limit the extent of any crack that may start.

The only reliable means of accomplishing this known to us are longitudinal slots in the deck or shell covered by riveted straps. We would recommend four such straps, two in the deck and two in the bottom, as a minimum. These straps should extend over practically the whole length of the cargo tanks, that is substantially from poop to forecastle.

In addition to installing crack arresters it would be desirable to clean up some of the poor welding details that are known to initiate cracks. As T-2 tankers built in different yards differ in some details, definite recommendations cannot be made until more is known about the particular ships involved. Furthermore, many of the poor details are the result of bad workmanship and do not appear on the plans. However, all sharp notches, improperly finished welds, etc., should be eliminated from the gunwale area. Bilge keels should be scalloped out in way of butts to prevent cracks which start in this highly stressed and vulnerable member from progressing into the strength members of the ship. The ends of the bilge keels should be tapered off so that they land on a transverse frame or bulkhead without forming a hard spot on the shell.

The following further modifications have been made to some of the T-2 tankers with the idea of preventing major failures.

The first two tanker failures ruptured the decks. As a result of this limited experience, four large I-beams were installed in many T-2 tankers just under the decks to tie the ships together in case the deck cracked. If I-beams are installed they will help a little and should be left in but if they have not been fitted we would not recommend installing them, as most of the failures have occurred in the bottom where these beams give no protection.

Some T-2 tankers have had eight riveted crack arresters installed instead of the four previously mentioned as a minimum. The additional four provide further protection by limiting the extent of any transverse failure.

A large number of cracks have occurred in the longitudinal and transverse bulkheads of some T-2 tankers. These cracks are usually short and as they apparently do not progress into the strength member of the hull rapidly, they do not constitute a major hazard. However, they are troublesome in that they permit leakage between tanks.

The welded connection between the end of the fluted section of the longitudinal bulkhead and the I-beam which continues it through the transverse bulkhead is fundamentally unsound. Most of the load is concentrated on the small section of welding backed up by the web of the I, while most of the longitudinal bulkhead material lands on the unsupported toes of the flange and is therefore ineffective.

Over 300 minor fractures have occurred at this juncture. These failures can be traced to design detail which causes stress concentration under both hydraulic and hull bending loads. Several remedies for this detail have been proposed but experience on their effectiveness is still lacking.

Cracks have developed also where the large tilting bracket on the vertical stiffeners of the transverse bulkhead lands on the bulkhead, forming a hard spot as it is supported only by the plating. This can be alleviated by fitting backing brackets on the other side of the bulkhead.

Some of the T-2 tankers have also been stress-relieved by the use of the Sun Linde process. The principle of this process is that of mechanical over-stressing by application of heat and cold. Stress investigations show that a stress pattern exists in all welded ships where stresses parallel to the weld are of greater magnitude than those across the weld. Stresses in the plate away from the weld are generally low. The Sun-Linde process is the only present practical method of stress relieving ships after they are built. Although this process is effective in reducing high welding stresses along the welds the true value of reducing the stresses has not yet been determined by actual experience. So far there is no evidence to show that this stress relieving is definitely beneficial although it is believed that it is probably a step in the right direction. Stresses normal to the weld are little affected by the process.

The process works as follows: Two special torches heat the plate adjacent to the weld causing the metal on each side of the weld to expand. The weld metal itself is kept cool by a water spray. As a result there seems to be a flow of stress which tends to average out across the area heated. Hand heating and quenching equipment is used in congested areas where machines are not adaptable. Self propelled automatic heating and quenching machines have been developed to run along the sides, deck and bottom where there are no permanent obstructions.

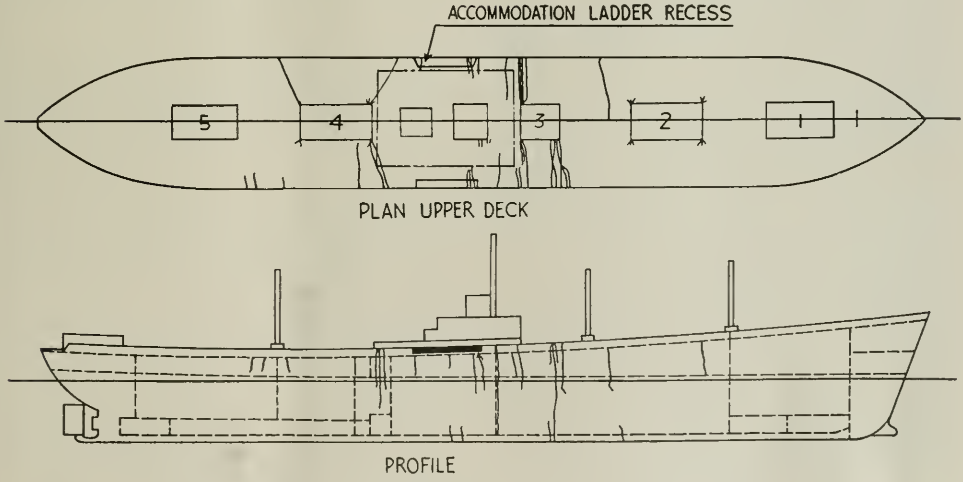
Repairing Damage

We come now to the question of repairing damaged welded ships. It is perfectly possible to make changes or repairs which could create or re-create conditions which correspond to the original defects. It is possible to make a repair which will duplicate or even worsen the conditions which caused it. Let us take some examples to illustrate the various kinds of mistakes which can be made and consider the underlying principles.

If we cut a new gangway opening, or cargo port, an access hatch, or ventilator opening, we can thereby introduce a discontinuity with square corners. It may look small and insignificant in area but the chances are that it will be an ideal place to start a crack.

The most vulnerable locations in the cross section of the T-2 tanker are the bilge and gunwale corners. They are the farthest from the neutral axis of the vessel and first to tear. If we add a bilge keel or repair a break in one, increasing the strength of its connection to the hull, we thereby more closely incorporate that bilge keel into the monolith of the vessel. It will attempt to absorb the stress, and not being designed for that purpose will fail, suddenly throwing the load on the bilge plates with almost explosive violence. Many bilge fractures found in practice have had their origin in improper construction and attachment of bilge keels.

(Please turn to page 96)



Composite diagram of Liberty ship fractures. (This illustration was used in the September story.)

At left: San Francisco ticket office of American President Lines at 152 Geary Street. View from sidewalk emphasizing show window aspect of interior wherein map display, ship model, planting and lighting are in harmony for display intent.—Center: Main display room in the New York office, showing elevator door of stainless steel brick, waiting area, new ceiling, and fluorescent lighting and incandescent spots.—At right: Broad view of main display room, showing glass-encased ship's model, desks, and backlighted glass map at far end of room.

REDESIGN FOR POSTWAR TRAVEL

By ELEANOR G. REID

PART II

San Francisco

Here the new passenger steamship ticket office was constructed in space formerly occupied by a railroad ticket office. The problem was to create a spacious and efficient interior in a single-story area of fairly low ceiling and of temporarily limited quarters.

Near San Francisco's Union Square, the ticket offices were designed to bear a direct resemblance to the Los Angeles and New York offices, and does so in layout, color, materials, atmosphere, and public relations value, the principal difference being in the ceiling treatment. Here, too, the idea was adopted of making the ticket office itself a full-view show window. Similarly, the design aim was effected by an open-front, direct-line ceiling lighting and by the planting box at the show-window glass facade. Faced with ceramic veneer, the planting box extends inside the building and is drained to the street. It is filled with more than a hundred leaf plants, the interior plants of a tropical variety. A ship model and world map similar to those in Los Angeles also appear as company identification markers, conveying a suggestion of world travel.

No provisions were made for future expansion in Los Angeles, but in San Francisco the space was planned to extend through eventually to Maiden Lane, at the rear of the premises, where these additional facilities can be accommodated. All ceilings of the main floor are acoustically treated, and lighting is mainly fluorescent. Incandescent spotlights set flush with the ceiling are added over the entrance, counter, and desks in order to maintain a high level of illumination where needed.

Again a canopy, bearing the company's name on its outer edge, projects a few feet over the sidewalk. The under surface of this canopy is continuous with the interior ceiling, but is faced with perforated Transite. The plate glass of the front is canted outward at the top, to reduce reflections, and in plan is angled inward invitingly toward the Herculite door.

The design and placement of the counter are similar to those in Los Angeles, together with the world map behind it. The same operating facilities and viewers are built into the counter.

New York

The New York office posed a very different problem from the offices on the West Coast. The space here is on the second floor of the Thornley Building at 604 Fifth Avenue, with access by elevator, and thus there was no question of facade or street-level display treatments. The front of the space, however, is almost completely walled with plate glass and because the church next door is set back from the sidewalk line, this plate glass is carried some 30 feet down the side. Thus there is excellent display across and down Fifth Avenue, but the resulting fish-bowl effect of the front office raised a problem of its own.

Because of the special character of the clientele served by this New York office, it was decided to omit a counter and treat the entire front portion of the area as an intimate reception room and booking office. The glass semi-partition, which had in prewar days screened this front space from the general business office, was replaced by a solid and more sound-proof partition; new and attractive lavatories were installed with convenient

(Please turn to page 102)

THE SHIP'S GALLEY PART IV MODERN PASSENGER LINERS

By A. J. Dickie

THE MODERN TREND IN AMERICAN passenger liner design runs to the all electric galley with steam for "bain marie" and for certain cleaning functions, and charcoal fires for certain broiling operations.

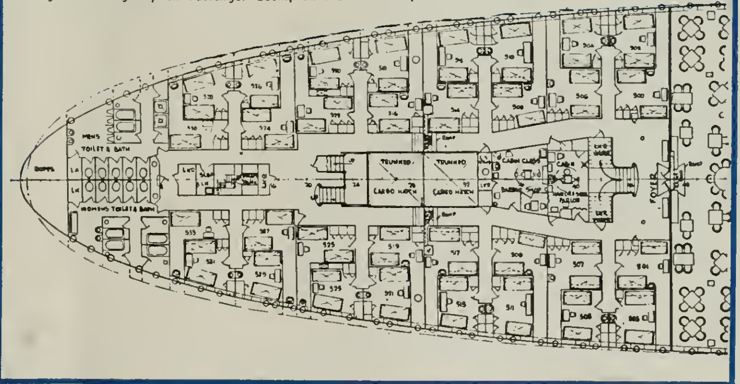
Several of the large electrical manufacturing firms have departments that specialize in galley appliances and for the past two decades it has been possible to procure on short notice spare parts for or entire replacement of marine electrical cooking equipment. This type of apparatus has become standardized to a considerable extent and much data are available as to its reliability, capacity, consumption of power and other features. The naval architect can specify by catalog number the equipment for any galley, and can design his galley space with complete confidence relying on catalog dimension tables. His principal problems are: choice of arrangement to facilitate streamlining of service to the dining rooms; ventilation and air conditioning to assure comfortable working conditions for galley personnel; rat and vermin-proofing; adequate dry and refrigerated storage of foods and table service for the voyage; and galley plumbing.

Since the majority of American passenger liners now in service were designed in the late 1920's and delivered in the early 1930's, their galley and pantry arrangements are approximately 20 years old. However very little improvement in ship galley design has been developed during the two decades immediately passed, and in some respects the galley and dining room arrangement on at least one type delivered in 1932 was a decided step in advance and is today unique, and in some respects superior, when compared with the arrangements of those compartments in any ship afloat. Therefore, without apology, we offer some of the galleys designed 20 years ago as examples of modern galley design for American ships.

Before describing these larger capacity galleys we would like to present a few more recent arrangements of galley and pantry produced under the Maritime Commission.

Shortly prior to the war six C-3 design cargo liners were altered to have capacity for some 90 first-class passengers on the regular Round-the-World service of the American President Lines. Operating out of San Francisco these vessels had the problem of maintaining a supply of food through three months of sailing in widely varying climatic conditions. The problems of location and arrangement of galley and dining room were much influenced by the internal structure of the type as a cargo carrier. The final result was a dining room and a galley very compactly arranged with no natural ventilation or illumination but completely ventilated and air conditioned by mechanical means. As will be noted in the plan and illustration herewith, this galley surrounds a vestibule whose forward end gives access through swing doors to the dining room. The galley proper is at the aft end of the vestibule and serving pantries port and starboard of the vestibule. Very clever interior decoration design transforms the long, narrow, low ceiling dining room into a spacious compartment with an apparent capacity much larger than its actual seatings. This arrangement has worked out very well in the service for which it was designed. Electrical ranges, ovens, and soup kettles in these galleys were furnished by Hotpoint. In approved plans for a new vessel, of much larger passenger capacity, recently designed for this service, the compactness of galley arrangement has been preserved. Here the architect has not only conserved service, time and motion, but also arranged the refrigerated and dry food storage so that it can be loaded without disturbing the galley and yet its contents be brought to the galley with the least possible expenditure of time and effort. The design work on these plans

Arrangement of galley on Passenger decks, on the S.S. Mariposa.



was prepared under the supervision of George Sharp, naval architect, New York City.

A Ferry Boat's Galley

Another up-to-the-minute modern galley is that of the new Puget Sound ferry Chinook. This is somewhat of an innovation and is more of a short order kitchen than would be the case on a regular ocean liner. However, since this galley may at any time be called on to provide meals for 1000 passengers it should rank with those of the ocean leviathans. It is located on the boat deck between a large circular dining room aft and a coffee shop forward.

The compartment occupied by the galley is approximately 18 feet wide and 30 feet long. This space is equipped with every modern electrically operated device to make the work of the chefs efficient and speedy including: Hotpoint ranges; electric toasters; dishwashers; vegetable peelers; meat grinders, meat slicers, griddles, waffle irons; egg boilers; coffee urns. Stores are moved from the car deck up to the galley by an electrically operated dumb-waiter with push button control. Another electrically operated dumb-waiter takes prepared food down to the crew's mess room under the car deck.

Passenger Liners

On large passenger liners it has become the accepted American plan to locate the main galley between the first-class and the cabin-class dining saloon or in modern Atlantic liner parlance between the cabin-class and the tourist-class dining saloons. This makes a very efficient workable layout for the main galley and its auxiliary pantries, bakeries and refrigerating rooms. All of these must be so arranged that the flow of prepared food from galley to dining tables is uninterrupted and streamlined.

The 1932 galley design to which reference is made in the introductory paragraphs of this section is the galley and dining saloon arrangement of the four Grace Line steamers designed originally for the intercoastal run from New York to San Francisco. In these vessels the galley, pantries, and dining saloon were given the promenade deck position. The main dining saloon occupied the space between the two stack casings, and the galley was immediately aft on the boat deck.

The passenger accommodations on these vessels were planned around the idea of using lighter, better balanced meals, and women waiters. The ceiling of the clerestory in the dining room was fitted with shutters running on rollers and operated by an electric motor so that by touching a button the chief steward could roll back these shutters and the diners have the sensation of eating out-of-doors. This effect was heightened by the long windows on either side.

The very compact galley was equipped to take care of approximately 160 passengers promptly and efficiently. Its location insured ample ventilation and sunshine. Its equipment included: three Hotpoint electric hotel ranges; one electric broiler with warming compartment; one large steam jacketed stock pot; one 3-compartment vegetable steamer; one 2-compartment refrigerator; a motor driven mixer, and a DeLaval motor driven milk emulsifier.

Four vessels—*Santa Rosa, Santa Paula, Santa Lucia,* and *Santa Elena*—were thus equipped and we have heard much favorable comment on the meals served on these vessels.

When the Matson Navigation Co. brought out the steamers *Monterey* and *Mariposa* for the California-Australia-New Zealand trade much thought was given to the galley and its auxiliaries. These vessels were fitted for 475 first-class and 229 cabin-class passengers, and 359 crew. To prepare and serve 3189 meals a day (and have these meals tasty-fresh of sufficient variety to please 700 passengers and 359 crew individually and collectively during a voyage of over two weeks through temperate and tropic zones), presents several very interesting and difficult problems. Chief among these are refrigeration and air conditioning of food storage chambers specially adapted to the various types of food carried. Reference to the arrangement plan reproduced herewith shows the arrangement of galley and pantries in relation to the two main dining saloons. The food storage is on the deck below, directly beneath the after end of the galley and the cabin class pantries and dining saloon. Side ports, starboard and port, on the "F" deck level permit direct loading into this storage. A freight elevator handles the stores for delivery from the store rooms to the galley. A spiral chute serves as a return from galley to store rooms, Refrigerated chambers for food stores include one each for poultry, eggs, butter, vegetables, fish, ice cream, and ice; and two for meat. An ice-making set and an ice cuber supplement the refrigerated ice storage room.

As will be noted on the plan, the galley arrangement is effected by the stack casing which divides its forward end. Access doors between galley and first-class dining saloon are to port and starboard of this casing, and this facilitates a circular flow of waiter traffic that demands a conforming layout of pantry facilities. Waiters enter dining saloons on the starboard side, and so the cold pantries and the coffee pantries are located on that side and the dishwashing pantries on the port or exit side.

In the cooking section of this galley there were eight Westinghouse electric hotel-type stoves grouped together as one big range with a single exhaust-type fume hood above. Adjacent to this range were two automatic-type large size Hotpoint fry kettles. In the same grouping were two Mitchell Woodbury charcoal broilers, and a large steam table. The coffee pantry contains Still urns for coffee and chocolate, Hotpoint egg boilers of the electric automatic type, and a Lyons milk and cream dispenser, as well as lockers, food warmers, and the like; next a cold pantry, fitted with refrigerators, dressers, table, and sink, and with a Sunkist juice extractor, Hobart power driven bread slicer, and a hand ice crusher; then comes the bakery, containing two Westinghouse electric ovens, one of 3-deck, 40-loaf type and one 3-deck, 60-loaf type, a proofing oven, a bread mixer, a Hobart food mixer, a steam-jacketed kettle, a trough for mixing dough, a confectioner's table, and an ice cream container, together with miscellaneous sinks, refrigerators, and shelves; the remainder of the starboard side forms a butcher shop, with appropriate tables, sinks, and dressers, and equipped with Hobart power-driven food chopping and meat slicing machines and a large refrigerator.

On the port side of the galley are pantries for glass and hollow ware, dishwashing, and silver washing. These are equipped with appropriate shelves, lockers, and dressers, and contain Crescent dishwashing machines and a silver buffer. A vegetable preparing room is on that side of the galley, and the outfit here consists of two Hobart vegetable peelers, a Hobart mixer, an Emery-Thompson ice cream freezer of 40 quarts capacity, an ice crusher and crushed ice box, and sinks and tables. The steam kitchen is on this side of the galley, containing three steam-jacketed kettles, a steam roaster, and a Born vegetable steamer. Then there is a scullery for stowage of cooking utensils.

Divisions within the main galley are made by combining light steel and wire mesh bulkheads, in which hinged panels are arranged to enable food to be distributed without requiring waiters to enter the pantries. Plate stowage is arranged in steel racks on the starboard side of the boiler casing and on shelves in other convenient locations.

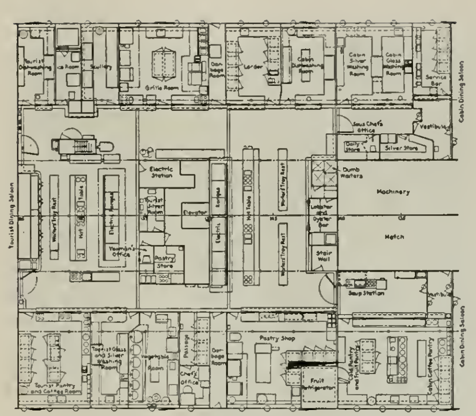
In addition to this equipment in the main galley there is much equipment in pantries on A, B, C, and D decks which are fitted to serve snacks, beverages, ices and the like, in staterooms or in public spaces. A pantry on the boat deck connected by dumb waiter with the main galley is equipped to serve meals in the officers mess.

America's Most Modern Galley

The latest completely designed ocean liner in the American Merchant Marine is transatlantic passenger liner *America*. Her galleys are thus described by her supervising architect in a paper read before the Society of Naval Architects and Marine Engineers in 1940, the year of her delivery.

"The galley for the crew and third-class passengers is on "B" deck just abaft the machinery hatch and just forward of it is the third-class dining saloon. A special kosher galley is farther aft on the starboard side. The latter is completely equipped to comply with Jewish custom, is conveniently located to serve the crew and third-class passengers and is provided with a dumb waiter for serving tourist and cabin-class passengers. The bakery and butcher shop are on the port side of the same deck, as well as the crew canteen, crew's pantry and various crew's mess rooms.

"When stores are brought on board through the stowing ports on "B" deck at frame 163 they are sent down to the ship's refrigerated spaces on "C" and "D" decks, or the stores spaces in the hold, by a selective spiral chute at frame 166 starboard. These stores are brought to the butcher shop and galley and pantry spaces by the electric elevator on the port side at frame 166. This arrangement of concentrating all stores into one section of the ship with one principal means of access, instead of scattering them about the vicinity of the galleys, is intended to enable the chief storekeeper to keep a more vigilant eye upon the stores. This is understood to be one of the reasons why the owners preferred this particular arrangement of the ship and of the machinery spaces.



Arrangement of main galley on S.S. America.

"Besides the galleys there are the hot and cold pantries, service spaces, chef's office, yeoman's office, coffee pantries, cold food and fruit pantries, bread and sugar room, lobster and oyster bar, vegetable room, silver storage, grill rooms, larder, ice cream room, dish-washing rooms, glass and silver washing rooms and a scullery and garbage room. Electric dumb waiters provide service from the main galley and pantries to service pantries on each deck above for room service, service bars and deck service. Spacious and modernly equipped and specially designed decorative counter bars are provided in the smoking rooms of each class and one in the cabin cocktail lounge. The *America* seems prepared in every possible way and with every imaginable facility to furnish patrons with the most delectable things to eat and drink."

We show here only the main galley arrangement. It will be noted that the cooking equipment is divided. There are seven hotel-type Hotpoint electric stoves installed as one range for the cabin passengers and five identical stoves as the range for tourist class. The third-class and crew's galley had another battery of five of these same ranges and the kosher galley had two ranges. The pastry shop is equipped with: one Hotpoint commercial type electric range with six 10″x10″ surface hot plates and a large capacity fully automatic oven; and one three deck bakeoven. All pantries and galleys are thoroughly equipped with automatic and semi-automatic electric apparatus for preparing and for cooking materials to produce 5500 to 6000 meals a day.

Next, working conditions and costs of operating the modern American seagoing galley.

Hampton Neergaard, marine superintendent for Burns Steamship Company in Los Angeles.

Port Engineer of The Month

Los Angeles-Long Beach Harbor

Hampton Neergaard of Burns Steamship

Hampton Neergaard is now the marine superintendent for the Burns Steamship Company at Los Angeles Harbor, who operate four of their own vessels, 30 vessels of Moller Steamship Company of New York, 10 under charter of the W. R. Chamberlin Co., and seven ships for the Olympic Steamship Co. Burns is also agent for the Alaska Transportation Co., J. H. Winchester Co., and Philippines vessels. Neergaard takes care of these ships at Los Angeles.

Neergaard was born in Paso Robles, California, and schooled in San Luis Obispo. Hamp went to sea at a tender age back in 1911. He shipped out as Junior Engineer in the Union Oil tanker, *Pectan* and later the *Coalinga.* With the coming of World War I, Hamp gained engineer Junior Grade with the Navy and served in the *Western Ocean* in the naval reserve in 1918.

On Christmas Day, 1918, Hamp was discharged and went to work for Standard Oil of California in Richmond, and was in the tanker *D. G. Schofield* until 1922, as first assistant engineer. He then went with the Hammond Lumber Co. in San Pedro until 1935, when he opened his own office as an independent surveyor and consulting engineer at Wilmington, California. In January 1944 he joined the Burns Steamship Company.

His home is in San Pedro, he is married and has one daughter—and is a grandfather just three times. His hobby is deer hunting, which he learned as a boy up around San Luis Obispo.

He has sailed with such well-known seamen as the late Vinc Carroll who was the chief of the Standard Oil tanker, *D. G. Schofield;* and also, A. L. Jones another chief for Standard Oil.

Mr. Neergaard is, at present, a member of the Board of Governors and original chairman and charter member of the Society of Port Engineers. He is one of the founding members of the Bilge Club.

THE BATTLE AGAINST RUST ONE OF FEATURES AT LOS ANGELES PORT ENGINEERS MEETING

A double-feature meeting was held on September 3 by the Society of Port Engineers, Los Angeles at the Hotel Lafayette in Long Beach. One was a motion picture accompanied by a lecture, called "The Battle Against Rust," and the other being a detailed description by Member Ed Harris of a remarkable repair job of cracked spiders in the main motor rotor of a T-2 tanker, presented herewith.

J. R. Boren, factory representative of Rust-Oleum in Evanston, Illinois, accompanied by his son, Bill (left), along with James P. McCay and George Fryette, both of Barnes & Delaney, Long Beach, distributors of the product.

"The Battle Against Rust" was given by J. R. Boren, factory representative of Rust-Oleum, a rust preventive paint produced in Evanston, Illinois, by Rust-Oleum Corp. Boren illustrated his discussion with movies on the manufacture and application of the rust preventive paint. Boren explained that Rust-Oleum is produced with a specially processed fish oil, which penetrates into the minute depressions of a ship's metal skin. The paint is applied by brushing, or by spraying or the dipping process. A three-hour drying paint, Rust-Oleum was developed during the war and today is used extensively on merchant ships, Naval vessels and oil company facilities in frigid and torrid climates.

Port Engineers -

Port Engineer of The Month

SAN FRANCISCO

Philip H. Thearle of The Port of Embarkation

Philip H. Thearle is back in his former job of superintending marine engineer for the San Francisco Port of Embarkation, Army Transportation Corps, the largest steamship operators in the United States. He returned in September, 1946.

His shipbuilding career started around 1909, when he was practicing naval architecture and marine engineering, and doing general superintending in several Coast shipyards, including Albina Engine, Skinner and Eddy, and Union Iron Works.

In 1932, he was naval architect and marine engineer with Theodore E. Ferris, New York, completing the designs of 985-foot U. S. Lines' superliners that were never built. In December 1935, he became the naval architect in the Superintending Constructor's office for Bethlehem's San Francisco yard, building the Destroyers Maury and McCall. From there, in October of 1938, he was naval architect in charge of new design at Bremerton Navy Yard, where they designed some light seaplane tenders and YT's. In July, 1939, he became superintendent marine engineer for the Army at Fort Mason.

During the war, in February, 1943, he was general superintendent of U. S. Navy Repair Base at Pier 25, operated by General Engineering and Drydock Co. From 1944 to 1946 he was assistant to general superintendent at Bethlehem, handling the rebuilding of the Swedish motorship Mirrabooca, outfitting of the U. S. Navy tanker, Kennabago, and the completion and outfitting of Admirals Capps and Eberle; rebuilding of Escort Carrier, Salamaua, and other large Navy repair jobs. Then in May of 1946 he became superintendent, Hull Division at Bethlehem-Alameda Yard, where they were building the Presidents Cleveland and Wilson. Now he is controlling the marine engineering problems of the San Francisco Port's 27 seagoing vessels. With him are four assistants and a large staff.

Philip H. Thearle, San Francisco Port of Embarkation.

He is reported to be currently occupied with his latest launching, a four-month old son.

UNUSUAL REPAIRS AT UHLIN MACHINE WORKS, Inc.

THE VIEWS DEPICTED ARE THE NEW AMERICAN BUREAU and Coast Guard method of repair to the main motor spider of T-2 tankers where factures have been discovered. They were taken during the progress of work on the *Fort Jupiter* in Los Angeles harbor by Uhlin Machine Works, Inc.

The method of repair procedure is as follows:

A high potential test is taken to determine condition of windings, using pressure of 1650 volts for a period of one minute. Clock readings at 12 points around the circumference of the rotor are then taken to establish the air gap. The stator is moved aft to clear the spider and make possible adequate protection of windings.

The spider hub and rim are then "Magnafluxed" to determine the length of fractures, and also locations. After this procedure the fractures are then drilled in way of the ends, minimum size of drill being ½ inch. No welding is permitted on the spider.

Templates are then made to insure an accurate fit for two ¾-inch thick reinforcing plates in halves for each end, the halves being at right angles on each end of the spider. Necessary holes are located on the templates at designated pitch circles, and pilot holes drilled in the spider for location of 4"x4"x¾" check blocks, to form a landing surface for the strengthening plates to compensate for any uneven surfaces on the spider. The plates are fabricated to template in shop, and bolt holes located and drilled, and plate face in way of holes spot faced for true nut landing; all holes being drilled undersize to allow for final drilling and reaming for fitted stud bolts. The plates are then installed in place being secured to the pilot holes previously drilled in spider. A total of twenty-four 1¾" bolts are then fitted in way of the hub rim. A total of forty-four 1" bolts are fitted in way of the outer rim, and thirty-two free fit 1" stud bolts are fitted in spider legs. Nuts were rung up on the inside of spider and on the outside of the re-enforcing plate, all nuts being tack welded in place.

Upon completion of the repairs the motor is thoroughly cleaned and searched, washed with carbon tet, and painted with insulating varnish. The stator is then moved back in position and again high potted to insure no damage to windings. Clock readings are taken, and necessary adjustments made for correct air gap. New fitted holding-down bolts are installed. Upon completion of repairs adequate dock and sea trials were performed.

Ed Harris, manager of Uhlin Machine Works, Inc. This view shows upper half of re-inforcing plate of main motor spider on the Fort Jupiter.

The above repairs were completed to the *SS Fort Jupiter* under the personal supervision of Edward L. Harris, manager, Uhlin Machine Works, Inc. of Wilmington. This vessel is operated by American Republic Corporation of Houston, Texas, represented by G. A. Robinson, acting port engineer. Sea trials were witnessed by John C. McKnight of the American Bureau of Shipping, Thomas Power of the Bureau of Marine Inspection and Navigation, George Clark, marine surveyor, representing the Maintenance & Repair Division of the U. S. Maritime Commission, and G. A. Robinson for the operators.

Fig. 1: The T-2 tanker, Fort Jupiter, at Berth 195, Wilmington, California. Fig. 2: Checking after end installation of reinforcing plates. This view also shows stator pushed back to allow for repairs. Ed Harris on the job. Fig. 3: At left, Kessler Taylor, chief engineer of the Fort Jupiter and G. A. Robinson, representing American Republic Corporation, operators of the Fort Jupiter. Fig. 4: View of reinforcing plate, forward end, of main motor spider on Fort Jupiter.

Pacific WORLD TRADE
Reg. U. S. Pat. Off

GIRL OF THE MONTH

ROBERTA GERKE WILL FLY TO LONDON in November to report the wedding of Princess Elizabeth for the Argonaut and several other magazines. Miss Gerke is taking a short leave from her regular position of Public Relations Director for The Robert Dollar Co. and Globe Wireless Ltd. to cover this special assignment.

In Europe she will also visit Paris, France and Geneva, Switzerland to gather material for a series of feature articles she has contracted to write for various magazines.

Miss Gerke first made the headlines in 1931, when as secretary to Governor James Rolph, Jr. of California, she was sent as an emissary of good will to the various State Capitols and large cities throughout the United States, carrying with her Governor Rolph's invitation for the governors and mayors to attend the Olympic Games in Los Angeles, California in July, 1932.

A few years later she made a trip around the world on the Dollar Steamship Lines. Traveling on the same ship was a well-known American newspaper columnist writing his experiences for his daily column. Occasionally she did some secretarial work for him and one day in Paris, after she had answered all his accumulated fan mail, he said to her: "Oh, I'm so tired of writing this column every day. I wish you'd write it for me."

Visualizing the thrill of being able to tell her friends she wrote the column one day, she rushed to her room, sat down at her typewriter, and spent the afternoon and evening composing what she thought was a facsimile of his column. The following day she took it to him at his hotel and watched breathlessly as he read it. Rather surprised, he commented, "Hmmm, that's good . . . why, it's very good . . . but it's not my style of writing. You have a style of your own and should become a writer."

With this encouragement Roberta Gerke returned to San Francisco to prepare for her new career. It was 15 years since she had graduated from high school. All of that time, with the exception of a year spent in traveling and six months at a business college learning shorthand and typing, she had worked as stenographer and then secretary in the business and political world. Her two most famous positions were; secretary to Governor James Rolph, Jr., and to Louis B. Mayer of Metro-Goldwyn-Mayer Studios in Hollywood. Her work had given her practical experience and the finesse of politics, but she felt that she must have a college education, a thorough knowledge of literature and languages to become a good writer.

Miss Roberta Gerke, public relations director, Globe Wireless, Ltd.

Roberta Gerke entered Mills College as a Freshman in September, 1936 and after four years of hard work received her BA degree on June 10, 1940. Her first writing job was for her alma mater, handling publicity for the Mills Club in San Francisco.

After Pearl Harbor Day her time was divided between

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COMMENT ON THE BRITISH LOAN

THERE HAS BEEN A GREAT DEAL of press and public comment concerning the early exhaustion of the United States loan to Great Britain and some intimition that ocean transportation charges absorbed a substantial part.

In an effort to establish the facts, the National Federation of American Shipping has been in communication with the interested government departments in Washington and has analyzed a speech in the House of Commons on August 7, 1947, by the Chancellor of the Exchequer, Mr. Dalton, in which he gave a complete accounting with respect to the American loan.

The following is a summary of the facts established by this investigation:

(1) British purchases of American commodities for the year ending June 30, 1947:

For	*% of Total*	*Amount*
Food	25%	$ 385,000,000
Raw Materials—includes petroleum	27%	415,000,000
Machinery	14%	216,000,000
Ships, Purchase of	7%	108,000,000
Tobacco	12%	185,000,000
Films	4%	62,000,000
Food, etc. for Germany	11%	169,000,000
Total	100%	$1,540,000,000
Exports to U. S. A.		340,000,000
Trading Deficit with U. S. A.		$1,200,000,000

Purchases in other parts of the Americas

Canada (mainly food)	$ 220,000,000
Central American (mainly oil and sugar)	260,000,000
Argentina and South America (mainly meat and cereals)	135,000,000
Total	$ 615,000,000
Total gross purchases from Americas	$2,155,000,000

(2) Applying estimated average freight rates to tonnage exported from the United States to the United Kingdom and Eire in the same period, the following are liberal estimates of the ocean transportation charges for such exports:

By American vessels

3rd quarter 1946	$13,000,000
4th quarter 1946	7,000,000
1st quarter 1947	12,000,000
2nd quarter 1947	16,000,000
Total	$48,000,000

By British and other vessels

3rd quarter 1946	$20,000,000
4th quarter 1946	13,000,000
1st quarter 1947	20,000,000
2nd quarter 1947	24,000,000
Total	$77,000,000
Total payment vessels of all flags	$125,000,000

(3) On the basis of the foregoing, the total aggregate ocean transportation charges from the United States to the United Kingdom and Eire amounted to 8.1 per cent of the dollar expenditures in the United States under the British loan, American vessels receiving 3.1 per cent and British vessels receiving 5 per cent.

(4) A portion of the amounts paid for transportation in the American vessels was disbursed for necessary expenses in foreign ports and these expenditures, payable in foreign currency, still further reduced the small dollar drain from shipping. The Federation stated that while it was customary to use 25 per cent of the total freight charge to estimate such disbursements, it used only 15 per cent in view of the substantial proportion of bulk cargoes involved and concluded that the net payment in dollars to American ships amounted to less than $40,800,000, or 2.6 per cent of the value of the total British purchases of United States commodities for the period.

(5) A minimum of 25 per cent of the freight charges would have to be made in dollars, if all ocean transportation now carried on American vessels were transferred to British vessels in order to pay port disbursements and meet other expenses of purchases and services in the United States. If all transportation to the United Kingdom and Eire now being carried aboard American vessels were transferred to British vessels, the British dollar shortage would be reduced by less than $28,800,000, or 1.87 per cent of the British loan.

(6) The proportion of American shipping participation in the United States-British trade is continually diminishing as additional British ships become available, primarily from new construction from British shipyards. The following are the latest percentages for April: Foreign 57 per cent, United States 43 per cent. For May: Foreign 62 per cent, United States 38 per cent.

(7) It should be noted that the amount expended for tobacco during this period was 12 per cent of the total purchases, or $185,000,000, being over 450 per cent of the dollar currency used for ocean transportation to the United Kingdom and Eire by American ships. Also that the purchases of films represented 4 per cent of

(Please turn to page 101)

THE RELATION OF CALIFORNIA AGRICULTURE TO INTERNATIONAL TRADE

By M. R. BENEDICT, Professor of Agricultural Economics,

University of California, Berkeley

THERE ARE FOUR MAIN CLASSES of California farm products, in terms of their relation to foreign trade. These are:

1. Those of which we produce a substantial excess over amounts needed to supply domestic demand. The growers of these crops are, of course, concerned with the strength of markets abroad and with the difficult problem of getting into the hands of foreign buyers sufficient dollar exchange to make possible a strong foreign demand. They are also much concerned with steps which look to freeing international trade as fully as possible from trade restrictions, currency controls, and state trading arrangements. Among the products in this group are raisins, prunes, apricots, oranges, barley, pears, canned peaches, canned asparagus, and cotton.

2. Products which we normally produce in quantities that are less than sufficient to supply the needs of the United States market. Growers of these commodities are concerned, so far as international trade is concerned, with the possibility that large foreign supplies will be brought in at low prices, thus injuring their market and lowering their prices. In this group are walnuts, almonds, figs, flax, olives, and wool.

3. Products for which imports and exports are of little direct significance, either as a favorable or adverse influence. This group includes a very large part of the nation's agricultural production and a substantial part of that of California. Among the products in this group are milk and cream, poultry and eggs, beef cattle, alfalfa, potatoes, vegetables, and small fruits.

4. There is a fourth category, not so well recognized, in which California farmers have, or should have, a lively concern with respect to tariff levels. This is the group consisting of farm supplies, particularly feed grains and fertilizers. California is a heavily deficit area for such products, particularly for corn. Huge quantities must be imported either from the Middle West or from abroad. We brought into the state in 1941 more than 400,000 tons of corn. It would seem logical therefore that both east- and west-coast livestock producers would favor minimum rates of tariff on their more important types of purchased feed. Fortunately this policy can be adopted without serious reprecussions upon the mid-west producer.

Forty Per Cent Affected by World Trade

A large percentage of the state's agricultural income arises from products not importantly affected either by exports or imports. For example, the income from dairy products, poultry and eggs, beef cattle, truck crops, and field crops accounts for some 60 per cent or more of the total.

Next in importance are the products which before the last war depended heavily on the export markets. These products, cotton, raisins, pears, prunes, apricots, citrus, and various others accounted for around 25 per cent of California's agricultural income in 1939. Since they are too numerous for individual analysis here, the relationships to international trade for one or two representative ones are presented in succeeding charts.

Third, from the standpoint of importance, are those crops which benefit directly from tariff protection. These —such as almonds, walnuts, figs, flax, olives, and wool— account for roughly some three to five per cent of California's agricultural income. Here also it is impractical to analyze in detail each of the products. Though not the most important one, the almond industry is taken as one of the most clear-cut illustrations of the general situation for this group.

Charts are shown herewith indicating the ups and downs of the crops of apricots and prunes. United States figures are used, but for these products they are substantially the California figures since more than 90 per cent of the product is produced in California. Here it is apparent that there is a relationship between the price of the product and the size of the export market though the full significance of this is by no means brought out by these charts. Agriculture tends to maintain production regardless of price. Hence, when demand is weak marketings remain high, and quantities moving into either domestic or foreign markets are not sharply contracted. The amounts not taken domestically usually go into the markets abroad at whatever price other countries are able and willing to pay for them. It is thus of great importance to the growers of these products that foreign buyers be in a position to buy freely of American products, and that such buying powers be widely distributed among foreign nations so the competition for them may be keen and active. Even for these products, however, it is obvious that the buying abilities and inclinations of American consumers are the most significant factor in the price situation.

However, for products of which from 10 to 40 or 50 per cent is normally sold abroad the domestic market cannot possibly maintain a satisfactory price if foreign markets are extremely weak. Hence the importance of strong foreign buying power to the growers of these crops. For many of these products the only alternative to the redevelopment of a strong foreign market is a drastic downward adjustment in production which probably can only be brought about by a long period of ruinously low prices.

To illustrate the third group of commodities the almond situation is taken as rather typical.

Here the usual situation is that the United States produces less than the amount used in this country. Considerable amounts are normally imported and since such imports must pay the prevailing tariffs the tendency of the tariff is to strengthen the price for American grown almonds. It is not safe, however, to assume too readily that these tariffs result in a United States price higher by the full amount of the tariff than it would be without the tariff. This depends on the other outlets available to foreign producers of the product.

It is quite possible that the best solutions for the various industries will be different, that some of them will run counter to traditional lines of thought among California farmers. For example, the wool industry has long placed its main reliance on tariffs. Recently, after a presidential veto, it has accepted continuation of a program which in substance is a combination of a price floor and a two-price mechanism somewhat the reverse of those frequently urged for major export products.

I believe the great majority of the farmers of California, and those of the United States as well, desire as soon as possible a world trade situation in which their products can move freely in whatever channels may be dictated by the usual type of private enterprise. They desire above all to see the liberally inclined nations of the world gain economic stability and sufficient unity that our kind of a society may continue to exist and prosper.

I have long had a keen interest in wool production and marketing. For many years I was an officer of a state wool growers association. I have long been familiar with the sheepman's predilection for the tariff as a solution to his problems. Yet I have also seen 57-cent wool, with wool on the free list, and 9-cent wool when it carried a tariff of 34-cents a pound. At present there are huge carryovers of wool in the world. They will have to be liquidated in one way or another before the industry can be on a sound free-enterprise basis. For some years governmental action will be more important than private action.

I am aware of the fact that United States wool production has been declining for some years. How big should it be? I don't know, and neither does anyone else. I think the industry has been wise in accepting a compromise that assures some stability in the industry until the problem can have more study. Some object that the program requires subsidies. But the traiff on wool is also a subsidy. Is it essentially different that we take an extra dollar out of the consumer's pocket by paying a subsidy or by levying a tariff? The dollar comes from the same place and eventually gets to the same place. It's merely the channel that's different.

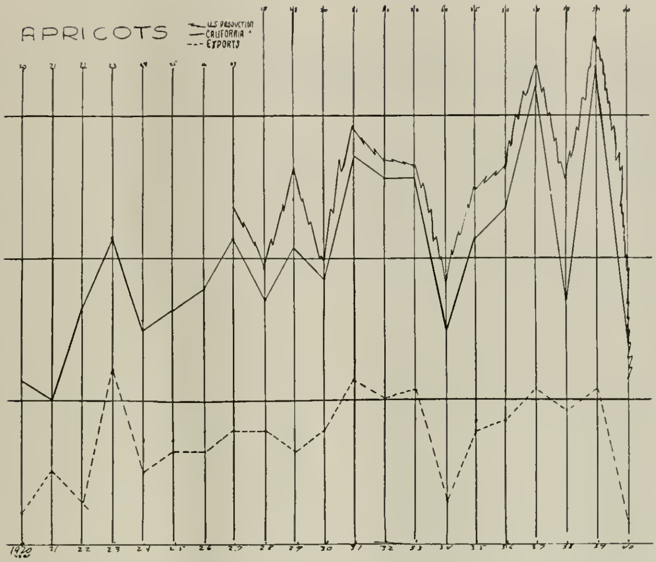
I am not suggesting what the position here should be. I do think that California farmers have more to gain through some sort of stabilization of world trade procedures, such as that which has been under consideration at Geneva, than they would have had through inclusion in the wool legislation of a mere authorization for the president to raise the tariff on wool, an authorization that probably would not have been used by any president, Democratic or Republican.

Almonds present a similar complex problem. They are an important export product for Italy. Italy is desperately in need of foreign buying power. We want her to get on her feet economically. We do not want to see her go communist. On the other hand, we do not want to see an established American industry wrecked through desperation selling by a foreign competitor who may be forced to get her product out. This may occur either through lowering her prices or depreciating her currency.

One thing we need to face frankly. Important as it is agriculturally and politically California is nevertheless not a big enough or strong enough tail to wag the whole United States. The middle West is becoming less protectionist minded than it was. Its major foreign trade product is wheat, and here its interest is on the export side. Hogs were once an important export product but the domestic market is now adequate to absorb the output in most years. The South has long been interested in export markets, particularly for cotton and tobacco. The Northeast, having outgrown its domestic market industrially, is increasingly interested in foreign outlets. Hence, too great a reliance on our ability to increase or retain extremely high tariffs would seem to me to be building our future on a sandbar that may be gradually washing away.

In achieving that end I believe the vast majority of Americans want to see main reliance for the guidance of trade placed on private enterprise rather than state trading. But state trading has become a very significant element in world trade, and may become more important. That outcome is virtually inevitable unless trade can be free enough so that most trading nations can remove restrictions on foreign exchange, particularly dollar exchange.

It is clear from what has already been said that a major problem from the standpoint of our export crops, and these are pretty important in California agriculture, is that of enabling other countries to obtain sufficient dollars to buy with. We may as well recognize that, for a few



years at least, the problem will have to be met in part through United States loans. Exports from the war-torn nations cannot arise fast enough to prevent a prolonged period of capital starvation. The longer that period of disorganization and underproduction lasts the more favorable is the seedbed for the spread of communism and other forms of dictatorship.

There are a number of things we ought to import in our own long-term interest. During this last war we drew heavily on many of our nonreplaceable resources, and some that recuperate very slowly. For such things as minerals, petroleum, lumber, and pulpwood we should, as a matter of reasonable foresight, conserve our supplies. Some other things we may find it advisable to import unless national defense policies call for production here. Rubber is one of these. Wool and sugar we are not likely to produce in sufficient quantities to supply our home

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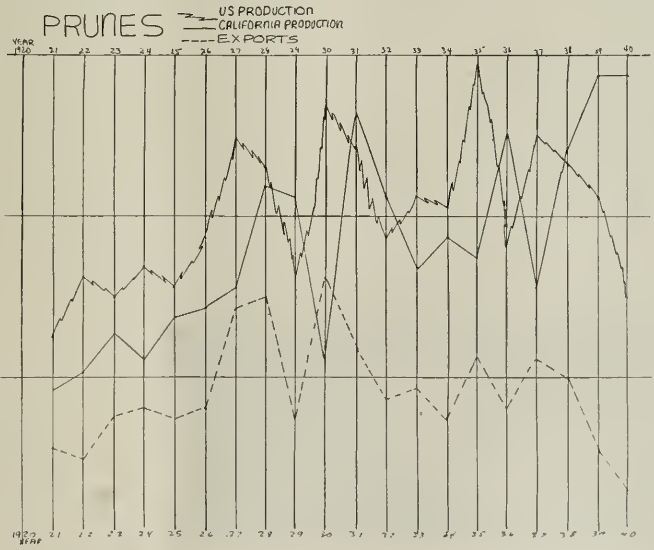

Marine Insurance

Live Japanese Mine Found in San Francisco Bay

Demolition experts from the U. S. Naval Magazine, Port Chicago, were recently called upon to destroy an unidentified mine which was discovered by a fisherman one mile north of Tennessee Point between Tennessee Cove and Pirate Cove in Marin County.

This was the most recent discovery of a live mine in the Bay Area but not the first. These mines are very dangerous and sometimes explode upon the slightest jar. The Navy has requested that any persons sighting an object that in any way resembles a mine, report it immediately to the 12th Naval District.

The mine was detonated with TNT demolition blocks two days after it was found. It exploded throwing a blast 500 feet into the air, leaving a crater four feet deep and 12 feet in diameter and could be heard over a mile away. It was later estimated that it contained about 300 pounds of explosives. The demolition was under the direction of Bill Mayer, demolition expert at Port Chicago.

Radar Photographs as Legal Evidence

A new use for radar in marine navigation promises insurance interests a high, unexpected stake in its adoption by shipowners. Recently the value of radar has been extended to collect permanent data on ship positions and routes, presenting visual, irrefutable log data and legal evidence already used in some courts. This is accomplished by photographing images as they are flashed on the radar oscilloscope. The logical extension of radar's functions, radar photography, is achieved by an especially designed electrical camera, the Mirar. Developed by the Fairchild Camera and Instrument Corporation for use with all makes of shipborne radar equipment, the Mirar automatically records every light and shadow seen by the radar receiver. During periods of fogs and darkness, just as on the clearest, calmest days, it records waterways objects and land masses, accurately showing distance and bearings of all the "targets" presented on the 'scope. Such radar photographic data is provided merely by flicking a switch.

The camera, using 100-foot rolls of 35-mm. film, takes 1,600 individual exposures per roll. Through an ingenious device, the intervalometer, Fairchild has provided for automatic exposures at intervals ranging up to as often as one picture for each pulse of the radar.

An extraordinary amount of data is obtained at small cost from a series of pictures, any one of which may be the decisive factor as protective legal evidence. Such photographs are accurate, easily interpreted, fully detailed, easily obtained, and tamper-proof evidence, materially aiding in the shipowner's protection and in insurance outlays. For ultimate safety, a ship should record every entrance to and from a harbor or along congested waterways, from the time it is within five miles of a channel until it is made fast to the pier or has been anchored.

The London Letter

By Our United Kingdom Correspondent

Jurisdiction In Collision Cases

TWO EVENTS DURING SEPTEMBER of more than usual interest and importance to marine insurance people are: (1) the holding of a full conference at Antwerp of the Comité Maritime International, and (2) the conference at Cannes of the International Marine Insurance Union. Among the matters to be discussed are the draft conventions on civil and criminal jurisdiction in collision cases, which were under consideration when war intervened. The proposal with regard to civil jurisdiction was that competence should be given to the courts of the nation in which the owner of the vessel against which proceedings were taken was domiciled, or the courts of the nation of which the vessel flew the flag. As another alternative, it was suggested that the courts of the nation, in whose territorial waters

Fairchild Camera & Instrument Corporation Mirar camera, for photography of a marine radar scope, is shown installed aboard ship. At right: view of the scope.

the collision occurred, should also be given competence.

That there should be some settled rule governing jurisdiction in collision cases is patently desirable. At present, if a vessel can avoid arrest immediately after a collision has occurred, she can practically evade any legal proceedings by avoiding waters in which she could be arrested. It is true that proceedings can always be taken against a vessel in the courts of her own nation, but the enforcement of any liabilities that may arise out of such proceedings is very difficult, if not impossible, if the owner has no attachable property which is within reach of the successful claimant.

Whether the Comité will revive the proposal for the compulsory insurance of passengers seems doubtful, but there are other matters which might well come within the purview of the forthcoming conference. For instance, there was the suggestion at this year's annual meeting of the Association of Average Adjusters, that the rules regarding interest on general average expenditure and on collision damage might well be revised so as to bring them more into line with modern finance.

Insofar as general average is concerned, we have many examples showing how inequitable was the present rate of interest under the York/Antwerp Rules in given circumstances; and as for interest on collision damages, the diverse rates of interest allowed under various national laws call loudly for unification, without any regard to current financial circumstances. The Comité might go even further and give consideration to the suggestion that the York/Antwerp Rules, as a whole, should be revised. At the Stockholm conference of the International Law Association, at which the current Rules were adopted, the inadvertent, but unfortunate, omission to advise the United States delegation of the proposed revisions resulted in America holding entirely aloof from the new rules for some years and adopting an incomplete version at a later date—a version which failed completely to give uniformity of practice on an international scale. If a further revision of the rules were to be undertaken, something approaching the desired international uniformity might be achieved.

Expirations On Hull Policies

During the recent war, underwriters in Denmark adopted the practice of making all hull risks commence on January 1 of each year, and this practice has continued since Denmark was liberated. In English practice, with risks commencing on all sorts of dates throughout the whole year, risks continue right into the last month of the second year, and that is why no very precise result of any account can be determined until the end of the third year.

At one time a very great volume of English business

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Admiralty Decisions

By HAROLD S. DOBBS *of San Francisco Bar*

Longshoreman Claims Under Warranty of Seaworthiness

EVER SINCE THE CASE of Seas Shipping Company vs. Sieracki was decided by the Supreme Court, other courts of the country have under certain circumstances consistently regarded it as authority for the right of longshoremen to claim protection under the traditional warranty of seaworthiness where he is injured aboard the vessel. It must be remembered, however, that in the Sieracki case the longshoreman was injured as the result of a defective appliance which to all intents and purposes appeared to be sound. The situation presented in the very recent case decided in the United States Circuit Court of Appeals, Third Circuit, reached a different result because the injured longshoreman was instructed to assist with the removal of a broken boom aboard the vessel which he obviously recognized as defective gear. The case is Bruszewski vs. Isthmian Steamship Company.

The longshoreman sued the General Agent for damages as the result of his injuries. A boom had broken in two uneven parts and the stevedoring company by whom the plaintiff was employed ordered plaintiff and other longshoremen to assist the crew in the removal of the broken boom. The removal operation was under the direction of the boatswain. During the removal operation the plaintiff was injured when a loose block, suspended in the rigging of the upper part of the boom, fell upon the plaintiff. The record of evidence submitted failed to show any facts upon which defendant's negligence could be based and the court concluded that whatever the reason might have been for the breaking of the boom, that incident occurred before plaintiff arrived on the ship. There was no evidence to show that the removal operation as directed by the boatswain was substandard in concept or execution. There was no reason to believe that the winch was defective or improperly operated. Plaintiff's counsel maintained that an inspection of the boom before it was removed would have disclosed the loose block. The court stated that to impose such a duty upon defendent would require the court to hold that, even when an object such as this boom was patently defective, it should have been inspected before it was moved. As a matter of fact, there was no assurance that an inspection would have revealed the danger presented by the loose block. Therefore, the only conclusion that can follow and that which the court adopted was that there was no evidence of an omission by defendant to do something which a reasonable man would have done under the circumstances.

Plaintiff further urged that he was entitled to recover under the shipowner's traditional warranty of seaworthiness. He was, of course, relying upon the Sieracki case. Although seaworthiness is normally a question of fact, the court concluded that no warranty of seaworthiness existed under the facts in this case. Logically construed, liability for an unseaworthy vessel should obtain only when the individual affected is entitled to rely, and does rely, upon the seaworthiness of something actually unseaworthy. To state that a broken boom is warranted as seaworthy would require distortion of the meaning generally accorded those terms. The court quoting from accepted authority stated, "The mere fact that a seaman has been ordered to do a dangerous thing does not establish a case of unseaworthiness."

In many of the cases in the past where injuries were sustained aboard vessels, the court has consistently followed the principle of refusing to permit an employee to recover for injuries received by doing an act to eliminate the cause of the injury. The reason is obvious in that it would be manifestly absurd to hold a master to the duty of providing a safe place when the very work in which the servant is engaged makes it unsafe. Therefore, in the instant case, the broken boom, an elaborate mechanism, presenting an obvious danger to those removing it, would not be classified as defective equipment as it was in the Sieracki case and the doctrine of unseaworthiness would therefore not apply. The court affirmed the judgment of the trial court which had dismissed the plaintiff's complaint.

CONCEALING PRIOR ILLNESS

Simply because the doctrine of maintenance and cure is so well established in the law of the sea, the shipowner is usually obliged to make maintenance payments and assume so-called cure expenses unless he can prove misconduct on the part of the injured seaman. The same result follows whether the disability arises from illness or injury occurring aboard the vessel.

In a recent case decided in our own Ninth Circuit, United States Circuit Court of Appeals, entitled Tawada vs. United States, the facts indicated that Tawada, by occupation a marine engineer, signed shipping articles for a voyage aboard the *Kate Douglas Wiggins* for a term not exceeding twelve months. The articles were signed September 14 but were pre-dated to September 2, 1944. On September 13, the ship being tied up in port, Tawada was given the customary "pre-sign-on" medical examination by the Public Health Service to determine his physical fitness for sea duty and for the purpose of determining whether or not he was afflicted with a contagious disease. As a part of the examination an X-ray of Tawada's chest was taken. The practice followed by the Health Service was to furnish certificates to the seamen in the event no disability was discovered by the routine examination before the X-ray films were developed. A certificate of physical fitness was furnished Tawada and he signed the shipping articles.

On September 15, 1944, Tawada was recalled by the Public Health Service for a further X-ray examination. Based upon a study of the X-rays last taken a diagnosis was made finding that Tawada was suffering from moderately advanced pulmonary tuberculosis. The examining physician advised Tawada to enter the Marine Hospital in San Francisco for treatment. Tawada followed the instructions of the physician. He signed off the *Kate Douglas Wiggins*, receiving the wages due him to that date.

Tawada brought a seaman's libel in personam for maintenance, wages and cure, pursuant to the Suits in Admiralty Act; Public Law 17; and the General Maritime Law.

Tawada denied having any knowledge of a tubercular affliction prior to being so informed by the examining physician on or about September 17, 1944.

Medical testimony introduced on behalf of Tawada indicated that he was afflicted with tuberculosis in June, 1944, or approximately two months prior to his service aboard the vessel. Tawada admitted that the conclusions reached by the doctors were correct. However, he contended that the condition as reflected by the examination was never disclosed to him.

The trial court found against Tawada, holding that he had not incurred, contracted or suffered illness, injury or tuberculosis while in the employ of the appellee; that he was suffering from a far advanced case of tuberculosis, of which he was aware, at the time he first boarded the *Wiggins;* and certain other findings relative to his failure to continue treatment at marine hospitals. The court placed great emphasis upon the fact that the action was one in admiralty and that the question of credibility of witnesses was one that should be left to the discretion of the trial judge unless there was a clear abuse of the discretion.

The contention of Tawada's counsel that the damages alleged resulted from a "light up" or "flare up" of an illness that existed in the past but had been arrested up to the point of the injury or further illness, is an interesting one because it appears to be an exception to the rule that is generally followed that a man need only act as a reasonable man would under the circumstances. The truth of the matter is that you take a blind man as you find him and your duty of care is determined by the circumstances which include the condition of the injured person prior to the injury. If a shipowner accepts a seaman aboard the vessel with tuberculosis that is temporarily arrested and during the course of the voyage the tuberculosis flares up he is generally held by accepted authority to be responsible for a substantial part of the cure that becomes necessary following the voyage. If the flare up resulted from some negligence on the part of the shipowner then in addition to the maintenance and cure claims, the seaman would be entitled to damages for the negligence even though the illness or injury occurred prior to the voyage.

It is not always possible for the shipowner to obtain

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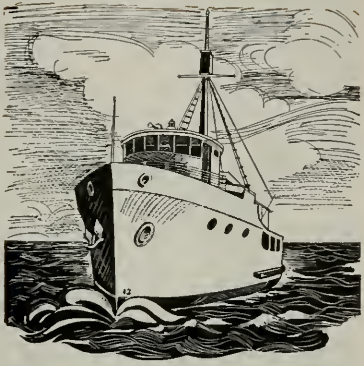
Coast Commercial Craft



TUNA CLIPPER LUCKY STAR

NATIONAL IRON WORKS LAUNCHED its eighth steel tuna clipper in the last two years on August 23, when the 106-foot *Lucky Star* slid down the ways at colorful ceremonies in the company's San Diego shipyard. Owner-manager is Manuel Freitas.

With a capacity of 2700 gallons of fresh water, 32,662 gallons of fuel oil, and 1390 gallons of lubricating oil, the *Lucky Star* will have a cruising range of over 10,000 miles. She will be able to bring home 173 tons of tuna, 145 tons in her brine well under the deck and the remainder in a brine well on deck. Molded beam is 28 feet, 6 inches; molded depth is 12 feet, and molded height to raised deck is 18 feet, 8 inches.

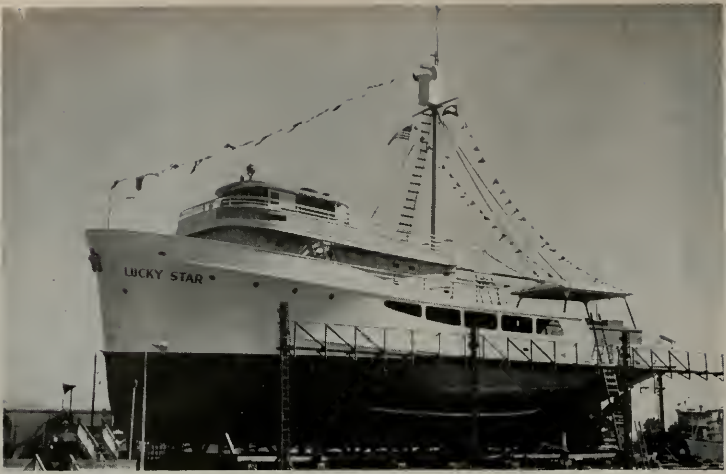
Insulation consists of five inches of cork in bottoms, sides and on extreme forward and after ends of below-decks brine wells, four inches of cork in intermediate transverse bulkheads, four inches of foam glass in shaft alley bulkheads, five inches of Fiberglas in main deck, four inches of cork around refrigerated bait box compartments, and four to five inches of foam glass around refrigerated stores compartments.

Five separate rooms provide quarters for 14 men, including two crew rooms, a radio room, captain's room and engineer's room. The well-appointed, modern galley is equipped with an Ingle range.

Refrigeration compressors include one 3½″ x 3½″, four cylinder, 20 hp machine, two 5½″ x 5½″, two cylinder, 20 hp machines, and one 2⅞″ x 2¼″, two cylinder, 3 hp machine for galley service. Baker Ice Machine Co., Inc. of Los Angeles designed and furnished the entire refrigeration system.

Main power plant consists of an Atlas 6-cylinder Imperial diesel, single acting, direct reversible, 4-stroke cycle, 13″ x 16″, 315 rpm, supercharged to provide 550 bhp. The engine is equipped with a Kingsbury trust bear-

Taken at the launching of the Lucky Star, at National Iron Works, San Diego. The slightly larger Ruthie B was described in some detail in August Pacific Marine Review.



Lucky Star nearing completion on the ways.

ing and is fresh-water cooled by means of heat exchangers.

Auxiliary generating engines are Atlas 6-cylinder Imperial diesels, 94 kva, 220 volt, 3-phase, ac generators direct-connected, 4-stroke cycle, 600 rpm non-reversible, 112 bhp.

Fifteen pumps are provided: They are two 10″ Campbell vertical bait pumps, ten 2½″ Consolidated Pump & Engineering Brine circulating pumps with 2 hp motors, one 2″ Fairbanks Morse fire pump with 5 hp Fairbanks Morse motor, one 3″ Campbell brine transfer pump with 5 hp motor, and one 3″ Westco Bilge Pump with 5 hp motor.

Electric service is 220-volt, 3 phase, 60 cycle ac electric power wherever required, with 110-volt single phase, 60-cycle ac lighting current throughout the ship.

The 72″ x 56″ propeller is by Doran Company, designed especially for the *Lucky Star* by William Lambie.

The steel shell plating is 5/16 inches thick. Floors are of the same thickness in the engine room and wherever they must be oil tight. Other floors are ¼″ plate. A 5/16 inch center vertical keel is provided.

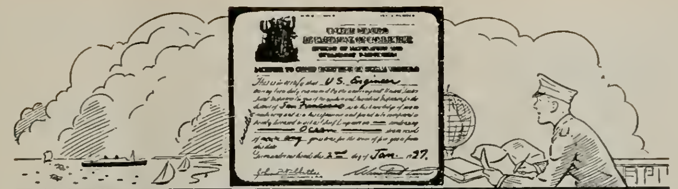
The *Lucky Star* is of the raised-deck tuna fishing type, built of electric arc welded steel, with a raked beam and a modified tuna vessel stern. The vessel is subdivided with five transverse oil and watertight bulkheads and a transom bulkhead, extending to the main deck, a cofferdam for chain stowage, a forward fuel oil deep tank, a machinery space, and eight brine wells arranged in two rows of four each.

Above is the USAT David C. Shanks docking at Bethlehem's San Francisco Yard.

DAVID C. SHANKS IN FOR CONVERSION JOB

The *David C. Shanks,* 12,097-ton C-3 type U. S. Army transport, docked at Bethlehem Steel Company's San Francisco yard August 26 for the first Army modernization conversion job of its type on the Coast since the war. Extent of the work required is seen in the fact that the transport will be in Bethlehem's Yard until next spring.

Major basic items for the conversion include changes and improvements in the fire control and ventilation systems, new furniture, fixtures and fittings throughout the ship, a new aluminum stack which will be built by the Yard, and the installation of eight new motor drive topping lift winches. New hospital equipment and a new operating room, dispensary, pharmacy, diet kitchen also are included.



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

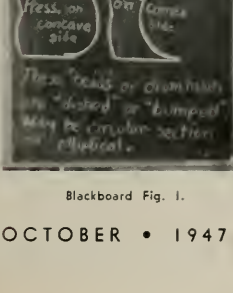
"CHALK TALKS" ON APPLIED MATHEMATICS

Heads for Boiler Drums

AN ARTICLE CALLED REGULATIONS and Material Specifications, published by the U. S. Coast Guard, covers the requirements for the heads of the drum of cylindrical boilers and pressure vessels. So that there may be no misunderstanding of the terms used, blackboard sketches 1 and 2 illustrate the meaning of concave and convex surfaces and elliptical sections. Note that the flat head may be used on shells having internal diameters of not to exceed 20 inches. Above this diameter flat heads must be stayed (supported against deflection under pressure) by stay bolts, furnaces, flues, tubes or other auxiliary members. Or if not so stayed, then they must be bumped, bent, or shaped into a semicircular or elliptical section.

We propose to develop the formula which gives the allowable working pressure on these bumped heads. Our next discussion will cover the development of the calculations for the stayed surface. For the present we have to consider the circular section.

The General Rules and Regulations permit the use of these bumped or dish shaped heads with the pressure either on the convex or the concave surface. This seems unusual until we note the sub-paragraph (g) page F-72, which requires that the steel shall be 40 per cent thicker for pressure on the convex side than that required for pressure on the concave side. Or, we can reduce the working pressure as calculated from the following formula to 70 per cent of the formula value for pressure on the convex side. This amounts to the admission that while we know that steel will withstand more load in compression (pressure on the convex side in our case), than it will stand in tension (pressure on the concave side in our case)—yet if the column of steel is long with respect to its thickness (cross-sectional



Blackboard Fig. 1.

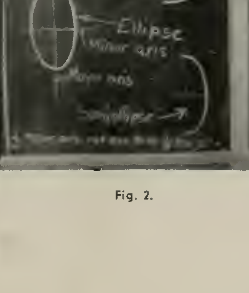


Fig. 2.

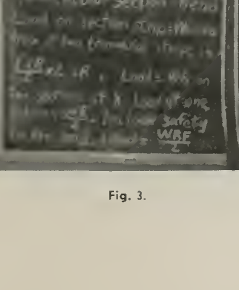


Fig. 3.

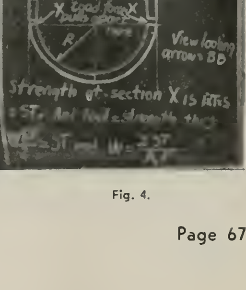


Fig. 4.

area small compared to length)—it may bend or buckle before it fails from crushing.

Attention is also called to the fact that it would be possible to make the head too nearly flat and still be semicircular or semielliptical in section. This is covered in the Regulations by the requirement as follows: for semicircular sections, the radius to which the head is bumped *shall not be* greater than twice the radius of the shell to which the head is fitted; and for the semielliptical sections, the minor axis of the ellipse to which the head is bumped *shall be equal to* or greater than the radius of the shell to which the head is fitted. Attention is called to the difference in the wording of the requirements as stated above, and as found in the Regulations. "The Chief" feels that the above wording clarifies the meaning but a study of both will surely give an understanding of the specifications.

As in our previous discussions the symbols and letters will have the following meaning:

W—maximum allowable working pressure—pounds per square inch.

T—Minimum thickness of the plate in inches.

S—minimum tensile strength of the steel—pounds per square inch.

R—radius in inches to which the head is dished. To measure on concave side, use greater value if two or more radii are found. Never less than 1.6 times radius of shell.

F—safety factor. 8.33 steel plate. 10.0 cast steel. 12.0 for cast iron.

Consider blackboard sketches 3 and 4. Let the radius of the head and that of the shell be the same. This gives us a hemisphere or semicircular section. The two upper views are the side section and end views. The lower right sketch (looking up at it from below) is a view of the sample segment cut out for study. All sketches show the section X which is a section of the plate one inch wide and T inches thick. This is the point at which the load or pull is to be measured. Then knowing the pull in the steel here, we can safely assume that it is the same at all similiar sections and therefore is the load on the steel. This sample segment which terminates in section X consists of two wedge shaped parts T inches thick and one inch wide at X, but zero inches wide at the point at the center of the head. The projected area of this wedge is 1xR over 2, or ½R, and for the two wedges is simply R. (Note: area of a triangle is ½ the base times the height.) The area being R, and pressure W, the load on one side or one section X is WxR/2. See sketch 3.

This is the force that tends to pull the steel apart at section X. On first thought, one might ask why this wedge would not break at some point where it is not as wide as at the base. In fact, why is not the very center of zero width the weak point? In our last article we discussed the difference between the circumferential and the longitudinal loads or stresses. Here is a case where the load is all longitudinal at the section X and gradually changes, being part one and part the other until, at the center C, (sketch 4) the load is all circumferential or hoop stress. That is, no load is transmitted through the exact center.

The stress at section X is easily seen to be ST since the section area is T because the width of the section is one. Equating the load and the stress we find, as shown in sketch 4, that W equals 2ST/RF. Compare this with the value for circumferential joints discussed in the last article where we found this same formula. Contrast with the formula for W for the longitudinal joint where we found W equals ST/RF times efficiency of the riveted joint, the difference is 2 to 1.

One might logically question the very large safety factors specified. Factors of only 4 or 5 were needed in calculating the shell plate. But the plate is likely to be nicked, dented and otherwise suffer a reduction in thickness in forming the dish which is not noticed or measured.

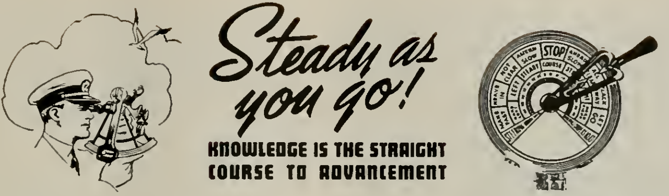
Another interesting emperical allowance for the unknown is the fact that we are permitted to make the radius of the sphere to which the head is dished or bumped equal to that of the shell, but our calculations for W must not use a value of R less than 1.6 that of the shell. This is a 60 per cent increase in the R, thus a reduction in the W of 62.5 per cent of the value given by the formula. (Mathematical note: 1/1.6 equals .625.) Therefore, there is no merit to using hemispherical dished heads as there is more surface steel needed and 60 per cent thicker steel is required. This reduction, when the R of the head is less than 1.6 of the radius of the shell, is not true theoretically. It is an allowance for the reduction in thickness of the steel when it is given the deep drawing operation to shape a flat plate into a hemisphere. There is likely to be much unnoticed damage to the steel even when formed hot and well hammered and heat treated.

On the other hand, to prevent the design from being too nearly flat the Regulations require that R shall never be greater than twice the radius of the shell. This flattens it out somewhat from that shown in sketch 3. Thus, if Rs is the radius of the shell then actually R may vary from 2Rs to Rs. Obviously R can never be less than Rs. And finally, in calculating W, use the value of R as measured but if R is less than 1.6Rs, then use 1.6Rs in the formula for W.

If the pressure is on the convex side calculate as above and reduce to 70 per cent of calculated value.

Our next article will discuss stayed surfaces, stay bolts, flat heads and development of corresponding formulae. •

The U. S. Coast Guard saves thousands of lives each year and does many other worthwhile jobs. Several thousand men are needed in the U. S. Coast Guard now!!



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE RULES OF THE NAUTICAL ROAD

AS INTERPRETED BY COURT DECISIONS THROUGH THE YEARS

PART I - FOG RULES

THE RULES OF THE ROAD, known as the traffic laws of the sea, are the most cussed and discussed of all the many complicated sets of regulations with which the Deck Officer must be familiar. It is an accepted fact that the present set of International Rules, adopted by the United States in 1897 are far outmoded, as are the Inland Rules which were adopted the same year. Vessels of today are many times larger than the vessels operating when the rules were designed, and it is not uncommon now for vessels to approach each other at a combined speed three times greater than the fastest ships of that era ever reached. While time alone has rendered obsolete many of the rules, one of the greatest hazards to safe navigation is that the mariner must change the rules under which he is conducting the navigation of his vessel every time he crosses that imaginary line separating our Inland waters of the United States from the waters where the International rules apply. In addition to making this change, a knowledge of the bare and factual rules, as adopted and published by the United States Coast Guard, is in many cases just not sufficient to enable the mariner to safely navigate his vessel. Court decisions and interpretations have greatly modified the rules, and it is the exceptional Deck Officer that has had either the time or the opportunity to study the rules to perfection. Yet when we consider the antiquity of the rules, the necessity of changing rules as the vessel moves into different waters, and the bareness of the rules as printed, it seems a wonder that our already high collision rate is not greatly increased.

The rules of the road may be divided into four natural groups: the enacting clause, rules concerning lights, rules concerning fog, and the steering and sailing rules.

It is the purpose of this article to explain and elaborate on the rules concerning fog, to the end of presenting the Deck Officer with a summary of the fog rules and the various interpretations of them as decided by our courts over a period of years.

The Rules Concerning Fog

"*Article* 15, (*Preliminary*)—All signals prescribed by this article for vessels under way shall be given:

First: By "steam vessels" on the whistle or siren.

Second: By "sailing vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds duration.

A steam vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn, to be sounded by mechanical means, and also with an efficient bell. In all cases where the rules require a bell to be used a drum may be substituted on board Turkish vessels, or a gong where such articles are used on board small seagoing vessels. A sailing vessel of 20 tons gross tonnage or upward shall be provided with a similar fog horn or bell.

In a fog, mist, falling snow, or heavy rain storms, whether by day or night, the signals described in this article shall be used . . .

"*Article* 16, *Speed in Fog*—Every vessel shall, in a fog, mist, falling snow, or heavy rain storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam vessel hearing apparently forward of her beam, the fog signal of a vessel the position of which is not ascertained shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over."

The above International rules, together with a description of the correct signal to be used by various vessels under different operating conditions, are just about all that the rules of the road have to say about fog. The only differences between the above rules and the corresponding Inland rules are that the fog horn on vessels operating under Inland rules does not have to be sounded by mechanical means, and the rule referring to the substitution of a drum on Turkish vessels is omitted.

Tabular Fog Signal Summary

The whistle and fog horn signals prescribed for various vessels are presented herewith in tabular summary form, as a means of allowing the Deck Officer to make direct comparison between the International and Inland rules. In this summary a short blast is represented by a short dash (-) and a prolonged blash by a longer dash (—).

Whistle Signals

	International		Inland	
Type of Vessel	Sig.	Min.	Sig.	Min.
Steam Vessel Underway	—	2	—	1
Steam Vessel Underway but Stopped With No Way On	— —	2	—	1
Steam Vessel Out Of Command	— - -	2	—	1
Steam Vessel Laying Cable	— - -	2	—	1
Steam Vessel Towing	— - -	2	— - -	1

Fog Horn Signals

	International		Inland	
Type of Vessel	Sig.	Min.	Sig.	Min.
Any Vessel Being Towed	— - -	2	— - -	1
Sailing Vessel, Stbd. Tack	-	1	-	1
Sailing Vessel, Port Tack	- -	1	- -	1
Sailing Vessel, Sailing With The Wind Abaft The Beam	- - -	1	- - -	1
Any Vessel At Anchor	Rapid ringing of ship's bell for 5 seconds each minute.			

Note: In the above summary, sailing vessel signals have been tabulated as short blasts. Although the rules merely prescribed a "blast", not specifying whether it is short or prolonged, it has been "The Skipper's" experience that most sailing vessels when making fog signals tend to use a shorter blast than the four to six second blast described as prolonged.

Interpretations of the Fog Rules

Theoretically, knowing the above rules as printed and being familiar with the various signals as summarized, the Deck Officer is capable of properly navigating his vessel through fog. The student of the rules, however, will have many questions arise which are not answered by the rules as published, and the prudent mariner will undertake a research and study of the rules to determine what the courts have decided about them. Before taking over a watch the Deck Officer should possess a thorough and instinctively correct knowledge of the rules, and it is surprising how much vital knowledge slips away through disuse, whether by reason of a prolonged vacation, a lengthy lay-up in the yards, or a long tropic voyage where fog is not encountered. The fog signal of another vessel apparently coming closer and closer is not the signal for the watch officer on the bridge to open a book, review the rules of the road, and then determine just what to do about the situation.

It is hoped that the following notes will serve to clarify and explain some of the rules of the road concerning fog.

1. The foghorn required on both steam and sailing vessels, under the International rules, *must* be sounded by mechanical means, a fog horn sounded by the breath being illegal. Also a sailing vessel, under Inland or International rules, is not required *or permitted* to sound fog signals on the whistle, even though the whistle would perhaps be more efficient.

2. The time interval between fog signals is the maximum time interval allowed by law. If the fog signal of an approaching vessel is heard apparently coming closer and closer, the Courts and good seamanship require you to sound your own signal more often, every few seconds if necessary.

3. If two or more vessels are anchored in a group, the Courts have decided that each vessel must make the proper sound signal. (A rapid ringing of the bell for 5 seconds each minute).

4. A vessel aground in International waters is considered to be a vessel at anchor so far as her fog signals are concerned, and must give the fog signal of a vessel at anchor. In Inland waters, however, it has been decided that the ringing of a bell by a vessel aground would tend to confuse an approaching vessel, and perhaps influence her to attempt passage on the shoreside of what she may take to be a safely anchored vessel. Therefore distress signals, such as a continuous sounding of the whistle, have been held to be the proper signal when aground in Inland waters.

5. The use of the "two prolonged blasts" signal, by a vessel dead in the water, is lawful only when *all* headway has been lost. Care must be taken, especially at night, to make certain that the vessel is dead in the water before changing from one blast to two. A Liberty ship cruising at about 12 knots, will move ahead for from 10 to 15 minutes after her engine is stopped.

6. A steam vessel out of command, under the International rules, sounds the out of command signal only as long as she is making way through the water. If she is dead in the water with no way upon her, she sounds the two prolounged blast signal for a steam vessel underway with no way on her. The reason for this, of course, is that the urgent information to convey to any approaching vessel is that she *is* dead in the water, and if she is dead in the water it does not materially matter whether she is disabled or not. This is the ruling, even though it is realized that a vessel able to kick ahead or astern is in a different position from a vessel unable to move at all.

7. Under the International rules, a steam vessel that is out of command and making way must indicate her condition by blowing one prolonged blast followed by two short blasts. Under the Inland rules, a steam vessel that is out of command gives the same signal as a steam vessel underway,—that is, one prolonged blast. However, although under the Inland rules the steam vessel out of command has no special fog signal to warn approaching vessels of her condition, she is not only permitted *but required* to warn any nearing vessel that she is unable to maneuver by blowing the *danger signal,* even though the other vessel is hidden from sight by the fog. The wisest course to follow, under the rules of good seamanship, would be to anchor if possible, and change her fog signal to a rapid ringing of the bell. Vessels have been held at fault for leaving a berth or anchorage during a fog, and also for failing to anchor in a fog when it was easily possible to do so.

8. The International signal for a steam vessel out of command (one prolonged blast followed by two short blasts) also applies under the International rules to a sailing vessel that is out of command. (In irons, becalmed, or with her sticks carried away). The sailing vessel will give this signal, of course, on her fog horn.

Under the Inland rules, however, a sailing vessel that is out of command continues to give the fog signal of the last tack she was on.

9. The fog signal for a vessel being towed, one prolonged blast and two short blasts on the fog horn, is an optional signal. The rules do not require it to be given, they merely define the signal to be used if a towed vessel wants to give a signal, the rule being optional because many vessels being towed are not manned. Under certain circumstances of towing and traffic, however, such as an exceptionally long tow, it is required by good seamanship that the vessel being towed sound this signal on her foghorn.

10. The signal for a steam vessel towing, one prolonged blast followed by two short blasts, also applies under the International rules to a sailing vessel towing. The sailing vessel would give this signal on the fog horn. Under the Inland rules, however, if a sailing vessel were towing another vessel she would just give the regular signal of a sailing vessel, according to the tack that she was on.

11. Under the Inland rules the Courts have decided that

(Please turn to page 104)

On the Ways

New Construction - Reconditioning - Repairs

COMBUSTION CONTROL FOR VICTORYS

When the first Victory ships were built in the hurry of war, they were designed for automatic combustion control to be installed at some future time.

Recently the first of those Victorys, one of three sold to a South African shipping firm has been equipped with Hagan automatic combustion boiler control. The ship in question, the *New Bern Victory,* has since been rechristened the *SS Constantia,* and has been dressed up considerably—including some luxurious passenger suites. The controls for the first vessel, which was originally designed as a low-cost C-1 cargo ship, were installed through negotiations between the Marine States Corporation and Simler & Sengstaken, Hagan agents, both of New York.

Servicing of the installation was performed by Bull & Roberts, also of New York, who represent Hagan and its affiliate, Hall Laboratories.

The vessel is Westinghouse turbine-driven with reduction gear and is of 6600 shaft horsepower. There are two Edgemoor water-tube boilers with 12,622 square feet of heating surface, operating at 525 pounds pressure. She was built at the Bethlehem Fairfield shipyards in 1945.

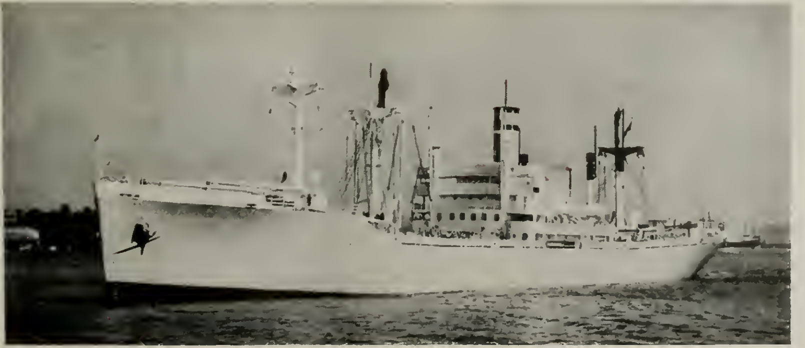
The adaptation of automatic combustion controls to Victory ships is too recent to afford operating economy figures. However, the controls are similar to those installed last year for the first time on a Liberty ship, the Canadian-owned *Mewata Park,* later named the *Harmac Crofton.* On two voyages through the Panama Canal from Vancouver, B. C., to England and return, the fuel consumption dropped from 25.1 to 22.5 tons per day, a saving a 13.3 per cent, as shown after completing a total of 17,000 miles.

The cargo vessel Loide-Honduras, ninth of a fleet of 14 ships being built by The Ingalls Shipbuilding Corporation for Lloyd Brasileiro, poised on the ways at Pascagoula, Miss. The contract for the 14 Lloyd Brasileiro ships is the largest single contract ever placed by a South American concern with a United States yard.

Few Victorys have yet been sold to private operators, the majority operating under charter from the Maritime Commission.

TODD COMPLETES URUGUAY BOTTOM JOB

The 20,183-ton Moore-McCormack liner *Uruguay,* ex-*California,* left the Brooklyn Division of the Todd Shipyards Corporation on September 5 after an extensive underwater repair job. The *Uruguay,* one of the shipping



The SS Constantia, Ex-New Bern Victory, sold to the South African Marine Corp.

The 20,183 ton Moore-McCormack Line Uruguay, gets a final daub of paint around the rudder at the Brooklyn Division of Todd Shipyards Corporation.

company's three liners being reconverted from wartime troopships to luxury passenger liners before re-entering the regular New York to East Coast South America service, had 87 plates replaced on her bottom and shell to put her in A-1 condition to meet safety-at-sea requirements.

When the vessel entered the Todd No. 1 Graving Dock on June 23, she was raised for inspection to determine the extent of necessary repairs. For five full days the entire hull from keel to light waterline was sandblasted to the bare steel and the interior of the hull was scraped to enable testers to drill a ⅜″ hole in each plate and gage its thickness. The thicknesses were then compared with those shown on the plans when she was built. Plates varying more than 20 per cent from the original thickness were condemned.

The plate-replacing job involved removal and replacing of 22 sea valves and 10 sea chests, and necessitated considerable removals of refrigerator cargo insulation and large quantities of wiring and piping in way of repairs. No work on frames was necessary because the internals were intact. Simultaneously 52 tanks were tested and repaired where they were in the way of the plate removals.

After replating was completed, the entire bottom of the vessel was painted—first with two coats of anti-corrosive paint, from deep load line to keel, followed by one coat of anti-fouling paint from light load line to keel, and topped off with two coats of green boot topping, from deep load line to light load line. Over 1000 gallons of paint were consumed; 85,000 rivets were replaced; 126 tons of sand were used for the paint removal, and almost 24,000 square feet of steel plating was installed to complete the job.

The *Uruguay* will be tied up in Section 20 of the Erie Basin for the account of the United States Maritime Commission until the final stage of her reconversion to peacetime status, can be undertaken.

RICHFIELD OIL TANKER USES GE RADAR

The *SS Sparrow's Point* is the latest to join the ranks of those equipped with a General Electric electronic navigator. A Richfield Oil Corp. tanker of 500 ft. length, the boat made a run between Wilmington and San Francisco with this invaluable aid to safety. The equipment was sold through Ets-Hokin & Galvan's Wilmington office, distributors of GE marine radar. It was installed in four days time, complete with construction and fabrication of mast and installation of the navigator, by the Todd Shipyards during regular drydocking. All wiring is concealed and considerable cabling is saved by the simplicity of the GE navigator.

Often called a "packaged unit" by the trade, the GE instrument is designed specifically for maritime service. It provides the mariner with an instrument to plot a safe course any time—day or night—even though his normal visibility is strongly limited by darkness, fog or rain.

Extremely simple in design, the navigator consists of two main parts: (1) the rotating antenna which is located on top of the ship's pilothouse; (2) the viewing console on which the radar picture is presented in the wheelhouse. The rotating antenna is analagous to a rotating searchlight in that it sends out radio beams to locate obstacles in the ship's path. No matter what material these beams strike, they bounce off and scatter. Some are returned to the rotating antenna, which acts as a receiving antenna, and they are reflected as bright spots on the face of a cathode ray tube which is similar to a television screen tube. The image thus formed on the viewing console forms a "radar picture," and fixed electronic marker-circles on the face of the screen indicate the distance of objects from the ship. These markers are calibrated in two, six and thirty-mile ranges.

While on its way north, the *SS Sparrow's Point* ran into heavy fog off Monterey Bay. The skipper spotted on the radar screen an approaching vessel nine miles away and changed his course 5 degrees. As the ships passed, the fog thinned very slightly and they were barely visibly to each other. The radar screen showed them ½ mile apart. To observe the channels leading from Wilmington's piers, the 2-mile radius is used; then the 6-mile scale in the outer harbor until on the high seas.

Running Lights

Edited by B. H. BOYNTON

(Official U. S. Navy photograph)

NAVY DAY IN SAN FRANCISCO

Visitors to the San Francisco Naval Shipyard these days, including the expected large crowds on Navy Day, October 26, will turn their attention toward such attractions as the nearly-completed world's largest crane, huge and modern new structural steel, ordnance, optical and supply buildings, and then to a supershow attraction, the twisted hulks that were target ships at Bikini.

Four of these targets, plus a division of four non-target, monitoring destroyers, have returned to this naval shipyard since Operation Crossroads ended. The once slightly radioactive destroyers have been made shipshape and returned to active duty. One of the targets, the submarine Parche, has been decontaminated and repaired and will soon become a floating armory for Bay Area sub-reservists. Three others, the light carrier Independence and transports Crittenden and Gasconade, remain. "Radioactive Ship—Unauthorized Personnel Not Permitted Aboard," is the way their signs read. Silent and alone except for security guards and the almost daily visits of scientists and workmen helping the scientists, the three ships stand. Torn and twisted, they receive the curious stares of yard workmen and visitors alike, a marvel of the atomic age.

Almost unnoticed in the large, sprawling, busy shipyard is a small grey, well-guarded wooden building, the Radiation Lab. This building is the home of one of the Navy's major scientific research centers in the field of studying results of atomic fission.

Research and scientific data gathered at this radiation laboratory will be used primarily for the nation's own security. All results are being correlated, together with other research work by military installations, and the Atomic Energy Commission. Results of such study will undoubtedly be of great value in helping to better understand and better use atomic energy. There is no telling what basic research will uncover, and at this naval installation Navy and civilian scientists are working together in various nuclear projects which may help us to learn how man can live and work with atomic energy.

Commander John J. Fee, officer in charge of the laboratory, is recognized by the Navy as one of the outstanding contributors to the success of the Bikini experiments.

(Please turn to page 106)

PROPELLER CLUB

Held at

▲
Bern De Rochie of Pacific Marine Review, chairman of the Prize Committee, announced the "lucky" winners.

▲
Carroll Reeves, De Laval Steam Turbine Co., chairman of the day, presents David M. Gregory, director of traffic of Olympic Steamship Co., the Propeller Club trophy. Captain A. F. Pillsbury (seated), world authority on ships and shipping and partner in Pillsbury and Martignoni, looks on. Presentation was made at regular Propeller Club luncheon the following week.

◄
Carroll again, Les White of Matson, George E. Swett, and Ed Schneider of Moore Dry Dock Co.; M. B. Moore, golf professional, is shown checking the scores.

In the largest and most successful golf tournament ever held by the Propeller Club of San Francisco many new names appeared in the list of prize winners but many an old timer was in there too. Top prize went to Dave Gregory of Olympic Steamship Company for low net, while low gross went to Worth Johnson of Republic Supply Company. The affair was held at Lakeside Country Club on September 12 and the pictures are proof of a happy time. There were prizes aplenty, and Bern De Rochie, chairman of the Prize Committee and his committee handling this phase of the program, did the usual good job. A complete list of winners follows:

Left to right: Carl E. McDowell, assistant to executive vice president and Gerald A. Dundon, vice pres. and general manager, Steamship Division, of Pope & Talbot; Josiah N. Knowles, partner in Pedley-Knowles & Company; Ed Harms, operating manager, Pope & Talbot; Eric Pedley, partner in Pedley-Knowles & Company, and James S. Hines, publisher, Pacific Marine Review.

GOLF TOURNEY
Lakeside

▲
Left to right: Lloyd Fleming, Pacific Coast director of U. S. Maritime Commission; Guy Buck, long-time Grace Line executive, and Carroll Reeves.

◄
Left to right: John K. Wagner, vice president; Raymond J. Pries, general freight agent; Lloyd M. Mauk, asst. to operating manager; A. L. Papworth, asst. to president; Hubert Brown, executive assistant; Frank L. Dwinnell, industrial relations counsel, and Irving F. Lyons, Jr., district freight agent, all of Pacific Far East Lines.

Tournament Winners

First low net: Dave Gregory.
First low gross: Worth Johnson.

Flight Winners

First flight, low net: W. Roe.
Runner Up: Bill Warren.
Second flight, low net: George McCord.
Second flight, low gross: Joe Hurd.
Runner Up: Bob Lillevand.
Third flight, low net: Ed Schneider.
Third flight, low gross: Les White.
Runner Up: Frank McGuigan.
Fourth flight, low net: Gene Essner.
Fourth flight, low gross: K. C. Tripp.
Runner Up: Fred Doelker.

Guest Flight Winners

First flight, low net: W. Emigh.
First flight, low gross: L. Mathis.
Runner Up: Bill Brigham.
Second flight, low net: H. Schoell.
Second flight, low gross: Mike Rhine.
Runner Up: A. Dutriz.
High Gross: John P. McArthur.
In Horseshoes, the winner was Ross Marble.

Donors of the prizes included the following:

Allied Produce Company
George F. Arata Company
George A. Armes

►
Left to right: R. Arthur Forster, general superintendent of Bethlehem Steel Co.; William B. Warren, principal surveyor, American Bureau of Ships, and guest.

►
Center: Mr. Forster; David Norman Lillevand, vice president of Grace Lines; Ed Senter, W. R. Grace & Co.; and George E. Swett, head of George E. Swett & Co.

►
Left to right: Hughes W. Ogilvie, George L. Crow, R. W. Turnbull, commercial vice president, and M. Rhine, all of General Electric Co.

Seated left to right: Roy S. Milligan, Earl V. Livingston and L. W. Aubry all of Standard Oil of California. Standing: Hosmer E. Smith of Standard Oil, Hugh Middleton, Pacific Coast manager, De La Rama Lines; R. W. Turnbull, commercial vice president in San Francisco, General Electric Co.; Lisle Small, president, United Engineering Company; Bud Stewart of Bethlehem; David Norman Lillevand, vice president of Grace Line, Inc.; and M. Rhine of General Electric.

The background includes: Bill Roe, John Beardsley, Guy Buck, Wm. Rogers and Walter Granicher.

P. L. Badt Company
Challenge Cream & Butter Assn.
Dohrmann Hotel Supply Company
Donovan Lumber Company, Frank O'Connor
Fairbanks Morse Company, Roger Murray
Foster Wheeler Corp., Robert D. Spear
Golden State Company Ltd.
Haas Brothers
H. T. Haviside
C. J. Hendry
Edward L. Heuck Corporation
A. Levy & J. Zentner Company
Marine Electric Company
C. W. Marwedel
Joseph A. Moore, Sr., Moore Dry Dock Co. (who oversubcribed.)
O'Brien, Spotorno, Mitchell & Compagno Bros.
Pacific Marine Review
Pacific Paint & Varnish Company
A. Paladini, Inc.
Poultry Producers of Central California
Republic Supply Company
Joe Roberts
S & W Fine Foods, Inc.
Schweitzer & Company
Thomas A. Short
Louis T. Snow & Company
Standard Oil Company of California
George E. Swett
The Guide—Wm. Empey
The Log
Tiedemann & McMorran, Inc.
Toumey Electric Company
Tubbs Cordage Company
Weeks-Howe-Emerson Company
The Young Company

PEDLEY-KNOWLES SUCCEEDS MARTIN & TURNER

Announcement has been made of the formation of Pedley-Knowles & Company, a new firm dealing in marine and industrial supplies. This new company has acquired the marine and industrial supply business of Martin & Turner in San Francisco at 134 Sacramento Street.

Eric L. Pedley, well-known polo player, who has been vice president of Martin & Turner, and manager of the San Francisco branch for the past two years, is president of the new firm. Previous to joining Martin & Turner, Pedley was a Lieutenant Colonel in the U. S. Army Air Corps.

Josiah N. Knowles, who is well-known in San Francisco marine circles, has also been connected with the firm for the past year. Knowles served as a Commander in the Navy during the war.

The third member is Roger Stewart, son of William H. Stewart, former president of the Bethlehem Pacific Coast Steel Corporation, and a director in the new firm. George T. Cronin of Borbeck, Phleger & Harrison, attorneys, is the other member of the Board of Directors.

Among the lines of marine and industrial products distributed by Pedley, Knowles & Company are: Bethlehem Wire Rope, Great Western Cordage, Pittsburgh Plate Glass Paints, Morck Brushes, Condenser Service & Engineering Company and affiliated company products, Boston & Lockport blocks, Wilcox-Crittenden marine hardware and California Cotton Mills' cotton products.

This firm will continue operations at the present address.

Left to right: Eric L. Pedley, Josiah N. Knowles and Roger Stewart.

SAN FRANCISCO OFFICE FOR U. S. LINES

The United States Lines' subsidiary, Panama Pacific Line, announce the establishment of their new San Francisco office at 141 Battery Street, on August 25, 1947. The executive offices, Freight and Passenger Departments are located on the 6th floor.

The plant and operating staff.

ELIMINATION OF FOREIGN BODIES IN MARINE AND INDUSTRIAL EQUIPMENT

During the past year at Los Angeles Harbor there has been formed the Marine Solvents Service Corporation, who offer the marine and industrial trade a controlled system of application of chemicals for the elimination of foreign substances in steam or diesel power units.

This corporation is sponsored by three well-known marine engineers, Albert O. Pegg, Bert Hale, and George McCoy, each of whom has had long experience in the design and operation of marine and industrial equipment.

Through much experimentation as to the type of equipment necessary to afford this service they developed both floating and land equipment. To make the service attractive to the shipowner and ship operator, many difficulties had to be overcome. For one thing, the time in which the application could be made was a major problem; the non-interference with the regular functions of the ship was another; then the location of the vessel (whether the ship was at berth, in the shipyard, or anchored in the stream, presented another difficulty.

In order to meet these conditions a 72-ton steel barge was built, and fitted with separate compartments for the handling of various commodities, such as raw chemicals and neutralizers. These compartments require non-corrosive type rubber-lined equipment, specially built. Special fluid pumps, pipe lines and valves were necessary, together with delicate instruments mounted on a special control panel to provide accurate handling. A steam boiler provides 4750 lbs. of saturated steam per hour at 200 lbs working pressure, with all necessary heat exchangers to be used in preparation of the unit for proper servicing. A 50 k.w.-a.c. diesel-driven generator is installed for operation of all motor driven pumps and air compressor, together with the necessary lighting load.

The fresh raw water capacity is sufficient for the average job; if necessary, however, distilled water can be made available When the barge is placed alongside a vessel, all that is required for servicing the particular unit is a 1½″ hose connection for the inlet and return, together with a small hose vent line for removing any vapors occurring during the operation. There are no obnoxious gases or residue, and the work is carried on in a clean and efficient manner.

In addition to the floating equipment, they have developed a mobile unit, so designed as to give quick and economic service on land. The same conditions are involved in the design of the mobile equipment as on the floating barge. The mobile unit consists of two tank trailers of a size to handle the average job. These trailers are completely outfitted, and they carry two sizes of mobile steam generators and air compressors, together with a small mobile lighting unit. A late model jeep of special design is fitted with all necessary power-driven pumps and heat exchangers and control instruments for adequate handling.


At top: Albert O. Pegg, president of Marine Solvents Service Corporation. Below: Bert Hale, vice president and general manager.

Albert O. Pegg, president of the company, has been in the marine field for over 45 years—37 of which was in the marine department of the Union Oil Company, and five years was as assistant general manager at California Shipbuilding Corporation.

Bert Hale, vice president and general manager, has had considerable technical training through his connection with several organizations, and 15 years at sea as Chief Engineer of modern vessels; four years superintendent engineer of Pacific Tankers, followed by two years as marine surveyor and consulting engineer.

George McCoy, general superintendent, has had 18 years as a marine chief engineer, and four years machinist apprenticeship, two years as port engineer for Pacific Tankers, and one year as engineer training and instruction officer for the U. S. Maritime Service.

Sperry's marine branch office at 128 No. Marine Avenue, Wilmington.

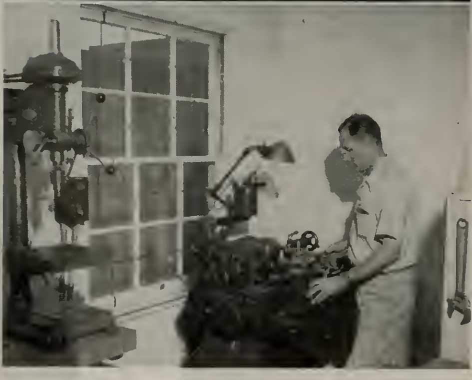
New home of Sperry in San Francisco at 525 8th Street, San Francisco.

PACIFIC COAST BRANCHES OF SPERRY

The Sperry Gyroscope Company has been making news on the West Coast recently. The accompanying pictures show new office facilities at San Francisco and Los Angeles as well as two of the folks who make the business tick.

More important than the new offices, however, is the announcement from G. W. Skinner, president of Alaska Steamship Company that the entire fleet of passenger and freight vessels operated by the company are being equipped with Sperry radar.

Sperry Loran was chalk-talked by Thomas F. Barnett, Loran instructor at the Seattle Sperry office, before the Puget Sound Society of Port Engineers September 10. O. B. Whitaker, marine sales manager for Sperry, flew from New York to attend the meeting.



◀ At left, above: W. H. "Casey" Emerson, supervisor marine service of the Sperry Gyroscope Co., Inc. Wilmington branch of the company's district office is at 2200 E. Imperial Highway, El Segundo, where W. I. Selover is district manager. The company also maintains servicing facilities at 619 Broadway Building, San Diego, under the supervision of W. O. Johnson.

At left, below: Shop facilities are available for the complete overhaul of Sperry's marine products. H. M. Richardson, service engineer, is shown at one of the South Bend lathes.

Below: Miss Bernice Di Piazza, secretary.

G. R. Anderson, director of Engineering, Beloit, Wisconsin; Roger M. Murray, manager, Fairbanks Morse & Co., San Francisco; V. O. Harkness, manager, Diesel Division, Fairbanks Morse & Co., Chicago; H. M. Olsen, manager, Fairbanks Morse & Co., sub-branch, Salt Lake City, Utah; H. G. Nagel, manager, Engine Department, Fairbanks Morse & Co., San Francisco.

Dale E. Willis, Marine Service representative for R. S. Smith Company of Wilmington, California.

PMR's staff photographer interrupted busy Ray Sullivan long enough to take this photo down in Wilmington. Mr. Sullivan is the district manager in Southern California for the Hagan Corp. and its affiliated companies.

DIESEL MEETING IN SAN FRANCISCO

A Diesel Engine sales meeting for all field engineers of the San Francisco Branch of Fairbanks Morse & Company was held at the Commercial Club on Monday, August 18.

V. O. Harkness, manager, Diesel Division of Fairbanks Morse & Company, Chicago and G. R. Anderson, director of engineering, Beloit, Wisconsin, were present and outlined Diesel developments and sales plans for the coming year.

Similar meetings of sales engineers of the firm were held in Los Angeles and Portland.

GENERAL ELECTRIC OFFICIALS MEET IN SAN FRANCISCO

R. W. Turnbull, San Francisco, new commercial vice president, General Electric Company, and R. M. Alvord, retiring vice president, are shown in the accompanying picture welcoming C. E. Wilson, president of the company to San Francisco.

All three men are officials of the General Electric Company. Mr. Wilson arrived in San Francisco direct from the East, traveling in a company plane. He visited San Francisco and the Bay Area enroute to the Hanford Engineer Works, Richland, Washington, where he addressed the G. E. workers on Labor Day. The Hanford Engineer Works is operated by the General Electric Company under U. S. Government Contract as part of the country's atomic program.

While in San Francisco Bay Area he conferred with company officials on expansion matters and visited San Jose where the company now operates a motor manufacturing plant, and where they will soon build a new $2,000,000 plant to manufacture electric motors from 1 to 500 hp.

Mr. Alvord retired at his own request under the company's Pension Plan during September, after 43 years of distinguished service.

Mr. Turnbull, who succeeds Mr. Alvord, began his electrical career in Los Angeles in 1909, and joined G. E. in 1912. From 1941 until his present appointment, he was president of Hotpoint, Inc., formerly Edison General Electric Appliance Company.

Left to right: R. M. Alvord, San Francisco, commercial vice president, C. E. Wilson, president of General Electric, greeted upon his arrival in San Francisco, and R. W. Turnbull, San Francisco, commercial vice president, shaking hands with Mr. Wilson.

◀ Gerald E. Donovan, vice president of Moore-McCormack Lines, Inc., with Mrs. Donovan and their daughter, Eleanor, aboard the Mormacsaga prior to sailing to Rio de Janeiro on August 2.

MARINE PICTORIAL REVIEW

▲ The popular cruiser, S.S. General Frank M. Coxe, former troop transport flies gala flags on daily sightseeing excursions around the San Francisco Bay. These cruises depart from pier at Hyde Street at 10 A. M. and 2 P. M. every day.

At top: Big wheels of the bay cruises are G. E. Holmes, general manager of Gray Line, Dan L. Dietrich, vice president and general traffic manager of the Golden Gate Scenic Steamship Lines and Captain George Hornsman, skipper of the vessel.

Below: The General Frank M. Coxe, a familiar sight on the Bay.

▲ Stuart Greenberg (right), president of M. Greenberg's Sons, is welcomed back to San Francisco by Elmer K. Ross, manager of sales, following Mr. Greenberg's trip to the Hawaiian Island where he called on distributors and jobbers of Greenberg brass products and Josam Pacific plumbing drainage products.

▲ Jim Camp, general manager and Arthur Zipf, head of new Chemical Cleaning Division, Western Ship Service.

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Cordes Bros.

ANNOUNCE NEW OFFICES and WAREHOUSE at

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- ALLEN, ROBERT G., COMPANY — Allenite Carbon Control — Allencote Refractory Coating
- BUTTERWORTH SYSTEM, INC. — Butterworth Tank Cleaning System
- COFFIN, J. S. Jr. COMPANY — Turbo Pumps
- FRANCE PACKING COMPANY — Metallic Packing
- FLEXITALLIC GASKET COMPANY — Flexitallic Gaskets
- GOLDSCHMIDT CORPORATION — Contra-Rudders
- LESLIE CO. — Regulators — Reducing Valves — Tyfon Whistles
- SANDUSKY FOUNDRY & MACHINE COMPANY — Centrifugal Cast Liners
- SELBY, BATTERSBY & COMPANY — Komul Anti-Corrosive Coating
- SEA-RO PACKING COMPANY — Sea-Ro Nek-Seal Packing — Pump Plunger Rings

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Also, Pump Governors, Temperature Regulators, Pressure and Temperature Controllers and Leslie-Tyfon Whistles.

LESLIE CO. LYNDHURST, NEW JERSEY

Established
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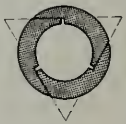
FRANCE METAL PACKING

For Steam and Diesel Engines



Manufacturers of complete Packings and Replacement Parts

France Marine Packings are well known all over the world for their dependable operation and low maintenance cost, serving the Marine Industry for more than 50 years.

THE FRANCE PACKING COMPANY
PHILADELPHIA 35, PA.

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The Pump The Industry is Talking About!

THE COFFIN
TURBO
PUMP—

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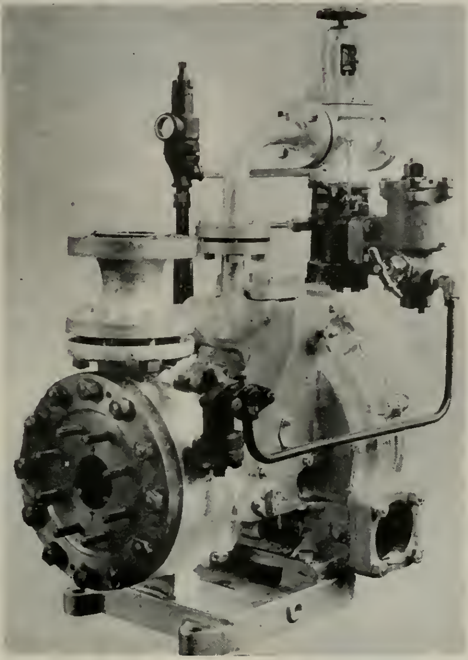
CAPACITIES TO
350 G.P.M.



FOR BOILER
FEED
SERVICE

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PRESSURES TO
500 P.S.I.

ONE UNIT—Centrifugal Pump, Steam Turbine

Saves Space, Weight and Steam

Send for Descriptive Bulletin

We extend sincere good wishes to

OUR NORTHERN CALIFORNIA REPRESENTATIVE

CORDES BROS.

34 Davis Street, San Francisco
In their NEW, LARGER quarters.

THE J. S. COFFIN, JR. COMPANY

326 SOUTH DEAN STREET
ENGLEWOOD, NEW JERSEY

34 DAVIS STREET - SAN FRANCISCO

Write NOW for Your

FLEXITALLIC GASKET BOOKLET

This new little book speaks of safe-sealing for fluids under pressure with the plain honesty the subject of safety deserves.

It tells with sketches and few words how the "Flexitallic" art which established itself in wide use through safe performance has now put safety on a new level.

You are not asked to abandon one theory and accept another. The book deals with a record of performance and identifies the practices that make the record possible. You are urged to believe only what pre-testing can—and will—prove to you.

WE'LL SEND YOU A COPY

A post-card will serve but you will help us in record-keeping by giving us the name of your company and your title or department.

"Flexitallic"

GASKETS OF THIS NAME

ARE MANUFACTURED ONLY BY

FLEXITALLIC GASKET COMPANY

ORIGINATORS OF SPIRAL-WOUND GASKET CONSTRUCTION

8th & BAILEY STREETS
CAMDEN, N. J.

Distributors in all Principal Ports

ALLENCOTE

REFRACTORY COATING

- **Prolongs Refractory Life.**
- **Reduces Number of Shutdowns.**
- **Improves Furnace Efficiency.**
- **Retards Flame Erosion.**
- **Saves Fuel . . . Saves Labor . . . Saves Refractories . . . Saves Time.**

An application of Allencote prolongs refractory life 3 to 4 times and increases on-the-line boiler time. Slag penetration is reduced and boiler efficiency increased. Allencote reduces flue gas and air seepage by sealing all refractory pores and joints, and virtually eliminates refractory spalling.

ALLENITE

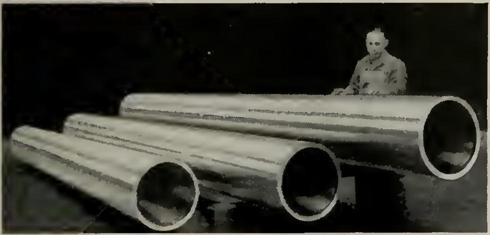
CARBON CONTROL

- **Removes Carbon Scale and Soot.**
- **Eliminates danger of stack fires.**
- **Cleans all inaccessible places.**
- **Removes carbon binder causing slag to fall off furnace walls and tubes.**
- **Non Metallic . . . Harmless to Boilers . . . Vaporizes Completely.**

Allenite is being successfully used in thousands of marine boilers by scores of shipping companies to eliminate troublesome carbon deposits affecting tubes, flues, economizers, air heaters, etc. No boiler using Allenite has ever had a stack fire, burned out an air heater, or had a carbon-plugged superheater or economizer.

ROBERT G. ALLEN COMPANY

15 MOORE STREET, NEW YORK 4, N. Y.



The Chief Speaks

"Cordes Bros., 34 Davis St., San Francisco and 301 Avalon Blvd., Wilmington, California, are representatives for the Leader of Centrifugal Castings.

"Propeller shaft sleeves, stern tube bushings, rudder stock sleeves and pump liners must be dense, uniform, free from porosity, accurately machined and produced in a minimum amount of time to meet ship schedules.

"Today, as in the past 30 years, Sandusky is meeting all of these requirements and furnishing a better product, in a minimum amount of fabrication time, at the lowest cost.

"Sizes from 3 inches to 46 inches diameters, and lengths up to 347 inches."—Chief Sandusky.

Specify Chief Sandusky Centrifugal Castings on your next application.

CHIEF SANDUSKY *CENTRIFUGAL CASTINGS*

SANDUSKY FOUNDRY AND MACHINE CO. SANDUSKY OHIO, U.S.A.

CORDES BROS., SAN FRANCISCO AND WILMINGTON, CALIF.

WE EXTEND SINCEREST BEST WISHES FOR THE CONTINUING GROWTH AND SUCCESS OF

CORDES BROS.

OUR FRIENDS AND DISTRIBUTORS OF

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A COLD-APPLIED

ANTI-CORROSIVE COATING

AT THEIR NEW, LARGER QUARTERS

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Long Lasting

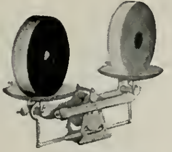
ALL PURPOSE SEA-RO NO. 535 Pump Valves

Sea-Ro No. 535 Pump Valves are custom made from a dense, fine grained phenolic base composition. This valve stock is treated with a binder, preservative, and impregnated with graphite, then laminated under pressure of 2000 lbs. per square inch. They are an all-purpose valve, eliminating the necessity for maintenance of various types of valves to insure economical operation. Sea-Ro No. 535 Valves are impervious to decomposition, warping and chemical action and can be resurfaced after years of service for extra duty under the toughest conditions.

Make these 3 Tests to be convinced

FOR SWELLING

Take one of your present pump valves and a Sea-Ro No. 535 of the same size. Boil them together in water for 24 hours. Then let the micrometer tell you its amazing story of Sea-Ro's resistance to swelling.



FOR ABSORPTION

Weigh both valves before boiling and then after. Let the scales reveal, as no words can, how Sea-Ro's laminated phenolic base resists absorption.

FOR SURFACING

Spot both valves on a face plate. You will immediately notice the velvet-smooth surface of No. 535 machine-ground into the dense, fine-grained Sea-Ro Valve.

FREE SAMPLE: We invite you to make these revealing tests on your pump installations. Send for a sample Sea-Ro No. 535 Valve without cost or obligation.

SEA-RO **INDUSTRIAL AND MARINE PUMP VALVES**

SEA-RO PACKING CO. • WOOD-RIDGE, N. J.

Pacific Marine Review

NEWS FLASHES

MANY MATSON FREIGHTERS UNDER CONVERSION

The conversion work on Matson freighters described in the May issue of Pacific Marine Review is now progressing rapidly in yards around the country.

General Engineering & Dry Dock Company, Alameda has:
Hawaiian Merchant
Hawaiian Builder
Hawaiian Packer

Federal Shipbuilding and Dry Dock Company has:
Hawaiian Refiner
Hawaiian Pilot

Sun Shipbuilding & Dry Dock Company has:
Hawaiian Rancher
Hawaiian Farmer
Hawaiian Wholesaler

The above are all C-3's.

Maryland Drydock Company, Baltimore has the C-2:
Ventura

Todd-Johnson Dry Docks, Inc., New Orleans, has the C-2:
Alameda

* * * * *

SPERRY RADAR ON ALASKA SHIPS

The entire fleet of combination passenger and freight vessels operated by the Alaska Steamship Company is being equipped with Sperry radar. The fleet operates between northwest and Alaskan ports. Mr. Skinner indicated that he considered radar a "must" in operating ships safely and efficiently in these waters in all weather.

* * * * *

LOS ANGELES DISTRICT, CORPS OF ENGINEERS, CONTRACTS FOR REMOVAL OF VESSEL WRECKED IN HARBOR

Sealed bids in duplicate will be received in above office, 751 So. Figueroa Street, until 1 p.m., PST, 14 October, and then publicly opened, for furnishing all plant, labor, materials and equipment (except government-furnished property), and performing all work for the above-described project in strict accordance with specifications, schedules, drawings and addenda, as follows:

Removal and satisfactory disposal of the wreck S.S. Markay, lying in Slip 1, Berths Nos. 167 and 168, Los Angeles Harbor.

* * * * *

CONTRACTS TO FOUR WEST COAST SHIPYARDS FOR COMPLETION OF THREE ARMY TRANSPORTS

Awards of contracts totalling $2,500,000 to four West Coast shipyards for completion of the safety modernization of three Army transports are announced by Brig. General N. H. McKay, commanding San Francisco Port of Embarkation.

The project, which eventually will involve 13 of the Port's passenger ships, provides for installation of modern safety equipment, fire protection devices and fireproofing to replace wartime installation.

The awards on the first four transports were as follows:

United Engineering Corporation, Alameda, work on the USAT General A. W. Greely for $444,102, to be completed in 110 days.

Moore Dry Dock Co., Oakland, work on the USAT General R. M. Blatchford for $550,000, to be completed in 90 days. Moore was awarded the hospital ship Hope also.

Todd Shipbuilding Co., San Pedro, work on the USAT General A. W. Brewster for $561,694, to be finished in 90 days.

Pacific Ship Repair Co., the USAT General Aultman.

* * * * *

RAYTHEON RADAR ON ALL "PRESIDENT" SHIPS

All "President" ships in the permanent fleet of American President Lines are now equipped with Raytheon radar. Installation work was done by United Engineering Company under supervision of the Mackay Radio and Telegraph Company.

The two big transpacific liners which are now nearing completion at the Bethlehem-Alameda Shipyards for use by American President Lines, the President Cleveland and President Wilson, will be equipped with both radar and loran.

* * * * *

SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS

The 55th annual meeting of The Society of Naval Architects and Marine Engineers will be held in New York City on November 12 to 15. 1947 at The Waldorf-Astoria. The annual meeting of the Council of the Society is scheduled for the afternoon of Wednesday, November 12.

* * * * *

QUAKER APPOINTS DUKE'S PACKING CO.

The Quaker Pacific Rubber Company, 168 Second Street, San Francisco, West Coast distributors of Quaker Mechanical Rubber goods, belting, hose and packing, announce the opening of a Seattle branch sales office, to serve the marine and industrial firms of the Northwest. The new offices are located in the Maritime Building at 911 Western Avenue, Seattle.

Announcement is also made by the company of the appointment of Duke's Packing Company, 520 North Avalon Boulevard, Wilmington, California as exclusive distributors for Quaker Marine Packing in the Los Angeles harbor district.

* * * * *

BIDS ON APL'S V-2000

Opening of bids by the U. S. Maritime Commission on the five proposed V-2000 liners for the American President Lines, first scheduled for August and then for September, is now scheduled for October 3. No Pacific Coast yards are known to be bidding.

* * * * *

ONE WEST COAST SHIPYARD'S SCHEDULE THIS WEEK:

Vessel	Nature of Work	Owner
Holland	Overhaul	Army Engineers
S.S. Atascosa	Repair and Conversion	Pacific Tankers
Mobilube	Repair and Conversion	General Petroleum Corp.
M/V Seagull	Drydock and Survey	Hillcone Steamship Co.
David C. Shanks	Conversion	Army
Mariposa	Drydock and Repair	Matson
Marine Adder	Voyage Repair	American President Lines
S.S. Lompoc	Hull Reinforcing	Union Oil Company
M/V Madoera	Miscellaneous Repairs	Transpacific Transportation Co.

* * * * *

RCA RADAR INSTALLED ABOARD 81 VESSELS SINCE JANUARY

Installation of RCA 3.2-centimeter postwar designed shipboard radar have been made on 40 American flag vessels and 41 foreign ships since the first of the year, and sales have passed the $1,000,000 mark. A total of 110 units have been purchased in 1947 from Radiomarine by American and foreign shipping interests.

* * * * *

ELLIOTT COMPANY MOVES IN SAN FRANCISCO

William R. Dunn, Pacific Coast manager of the Elliott Company, Jeannette, Pa., announces the removal of West Coast headquarters offices of the company to the Russ Building, San Francisco. This is also the West Coast headquarters for the Roto Division of the Elliott Company, manufacturers of Roto Jet Boiler Tube cleaners.

* * * * *

ISTHMIAN TAKES ON 30-MONTH JOB OF MOVING PIPELINE TO ARABIA

What has been called the largest single contract ever signed by a steamship company, calling for Isthmian Steamship Company to move the American Arabian Oil Company's pipeline from U. S. ports to terminals in the Mediterranean and Persian Gulf, was announced recently by the company president. It will take approximately 30 months to complete the job, and the fleet to carry the 265,000 tons of pipe plus construction equipment and foodstuffs will include not only the huge Isthmian line, but the Pacific Far East Line and possibly one or two more sub-contractors.

The shipments will move outward from Baltimore, New York, Philadelphia, Houston and Galveston, and through Pacific ports ranging from Seattle to Long Beach.

* * * * *

HERB SOUTHWORTH MOVES IN SAN FRANCISCO

Herbert L. Southworth, owner of the Herbert L. Southworth Company announces the removal of offices to Room 402 at 110 Market Street, San Francisco.

This company is Pacific Coast representative for the Kingsbury Machine Works, manufacturers of Kingsbury thrust and journal bearings, and Northern California representatives for Murray & Tregurtha Harbormasters.

* * * * *

LONG BEACH SHED BIDS

Bids were opened by the Port of Long Beach at 10:00 a.m. on Friday, September 19, for the construction of one of the world's largest transit sheds at Berths 6 and 7, Pier A. This shed will measure 1152' by 200' and will be of steel and concrete, clean span construction.

* * * * *

NEW COLUMBIA MILL AT LOS ANGELES

J. Lester Perry, president of Columbia Steel Company, United States Steel subsidiary, announces that a cold reduction mill with a capacity to produce over 300,000 tons of sheets a year will be built by that company in the Los Angeles area. It is hoped that construction of the new mill will be completed by the end of 1949, provided no unforseen delays occur.

In addition to cold reduced sheets, the new mill will be equipped for hot rolled sheet processing and for sheet galvanizing and coating, in order to meet the West Coast demand for these types of products.

* * * * *

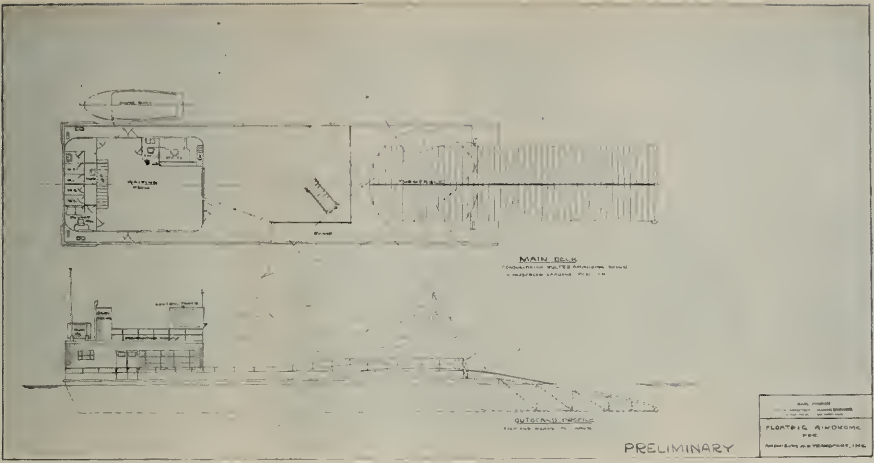
INDUSTRIAL DEVELOPMENT IN LOS ANGELES

During the month of August, 20 new factories were established in Los Angeles County with a total investment of $1,073,000. Thirty-eight existing plants were expanded, calling for an additional investment of $4,449,000.

Total investment in the 58 new and expanded units was $5,522,000, creating a total of 1158 new jobs.

For the year to date, 152 new factories were established with a total investment of $35,974,000; 269 existing plants were expanded, calling for an additional investment of $34,914,000.

Total investment for the year to date in the 421 new and expanded units was $70,880,000, creating 14,733 new jobs.



FLOATING AIRDROME

THE AMPHIBIAN AIR TRANSPORT, INC. of Long Beach, California has commissioned Karl French, naval architect-marine engineer of San Pedro, to design the conversion of a wooden barge into a floating airdrome for their Catalina terminus. The barge, 110′ long and 30′ beam by 8′-4″ depth, was purchased from Government surplus.

At the present time, Amphibian Air Transport, Inc. operates 13 flights per day from the Long Beach Municipal Airport, and 6 flights per day from the Lockheed Air Terminal at Burbank to Avalon and return. Grumman Amphibians are employed in this service. Amphibian Air Transport, Inc. has purchased several Sikorsky Amphibian planes, which are much larger than the Grummans, in order to meet the growing demand for this rapid and convenient service to Catalina.

The new airdrome is intended to reduce the material hazards attendent on the operation of amphibian aircraft to a minimum, and to provide most comfortable, convenient, and modern landing facilities for the passengers. The Naval Architect's preliminary plan shows the arrangement of the airdrome.

At one end of the barge, a ramp approximately 40′ long will be constructed. This ramp, which will be supported on structural steel and steel pipe trusses, will extend far enough below the water at its outboard end to provide ample clearance for the successful docking of the deepest draft amphibians which will be employed in this service. To provide this depth of water over the end of the ramp without making the ramp unduly long, the barge will be ballasted with fixed ballast sufficient to reduce the freeboard to 18″, which is considered to be the practicable minimum. Walking spaces at the barge deck level will be protected by a bulwark about 2′ high.

After landing in the water, the airplane will taxi up onto the barge under its own power and onto a turntable. The turntable will then be rotated to the proper position for unloading and loading passengers. After the passengers have been loaded, further rotation of the turntable will put the airplane in position to taxi off the barge and into the water for take-off. A winch, with suitable cable will be installed so that airplanes may be brought up the ramp even though their engines are not running.

The deck of the ramp and of the turntable will be

(Please turn to page 104)

Barge on which ramp will be built for seaplane base in Avalon Bay, Catalina.

John Cordes
Owner of Cordes Bros.

CORDES BROS. in NEW LOCATION

R. W. Murray
Sales and Service Engineer for Cordes Bros.

Cordes Brothers, veteran distributors of marine specialties in the San Francisco Bay Area, have moved to new quarters at 34 Davis Street, providing attractive offices and display rooms, warehouse, and greatly enlarged repair facilities for reconditioning Leslie refrigerators, Coffin pumps and Butterworth machines.

Founded just 20 years ago by John Cordes, now owner of the San Francisco firm, and his brother, Fred, who later opened his own business in Los Angeles. The company originally opened offices in the Fife Building. Later they moved to 200 Davis Street.

They started out as marine surveyors and distributors for Sandusky Foundry & Machine Company, Centrifugal cast liners, soon adding Goldschmidt Corporation, contra-rudders; Butterworth tank cleaning systems, and Leslie Co. regulators; then others from time to time so that the firm now represents almost a dozen well-known lines of marine specialties. To keep pace with the increased lines handled by the company, the sales organization has been expanded to include Lowell Jett and Ralph Murray, sales and service engineers, and Art Lewis, service and maintenance engineer.

John Cordes has long been identified with the marine industry having started his training as a machinist at the old Union Iron Works. Later he joined Standard Oil Company of California as a marine engineer, and was promoted to marine inspector. From this position he resigned in 1927 to open his own business. In addition to his duties as head of the Cordes firm, he also acts as an independent marine surveyor.

Among the manufacturers represented by the Cordes firm today are: Leslie Company, regulators and Tyfon whistles, pressure reducing valves, temperature regulators, pump governors, self-cleaning strainers and pressure controllers; Selby, Battersby & Company, Komul cold applied anti-corrosive coating for marine service; Sandusky Foundry & Machine Company, centrifugal cast liners; J. S. Coffin Company, pumps; France Packing Company, metallic packing; Sea-Ro Packing Company, packing; Flexitallic Gasket Company, gaskets; Robert G. Allen Company, Allenite soot eradicators and Allencote refractory coating; and Butterworth tank cleaning systems.

Below, left: New headquarters of Cordes Brothers at 34 Davis Street in San Francisco.
At right: The maintenance shop. Lowell Jett (left), sales and service engineer and Art Lewis, service and maintenance engineer.

KEEP POSTED

New Equipment and
Literature for Yard,
Ship and Dock

GENERAL PETROLEUM CRUISING CHARTS

A series of cruising guides for yachtmen sailing west coast waters from Ketchikan, Alaska, to San Quintin, Mexico, is being distributed gratis by General Petroleum's Mobilgas Marine dealers on the west coast.

Three different guides are offered. On one side of each, two panels show the waters from a point above Ketchikan to a point below Coos Bay and from Coos Bay to San Quintin. The reverse side illustrates in more complete detail the waters of Southern California, San Francisco Bay and adjacent waters, and the Puget Sound and Columbia River areas, respectively.

In cartograph style, various landmarks and other features are shown; bearings of popular routes indicated and various other features are given. Included are the international code, storm signals, mileage tables, radio wave lengths, buoys and markers of various types, and other data.

The cruising guides are intended to supplement, rather than supplant, regular marine charts, the company explains, and are intended as a guide in planning cruises.

MELETRON MODEL 310

This device has been widely used as a control mechanism in such fields as, chemical processing, petroleum, food processing, heating and air conditioning, pneumatic and hydraulic systems, machine tools, aircraft, etc. The Model 310 is one of Meletron's wide line of switches actuated by the pressure of liquids, air or gasses.

These devices embody such special features as convenient adjustment, explosive-proof design for hazardous installations or construction which prohibits tampering, by the operator, with the pre-set operating characteristics. The Meletron Corporation offers an extensive line of pressure operated switches from stock and is equipped to design and manufacture in large quantities devices for specific applications.

AXIAL AIR-GAP ELECTRIC MOTOR

Fairbanks, Morse & Co., Chicago, have introduced an entirely new type of electric motor designated as Axial Air-Gap.

The new line of motors, ranging in size from 1/3 to 10 hp, is suitable for horizontal or vertical flange mounting, or on an angle for belt drive. The outstanding features of the new motor are space and weight reduction, the new motor being less than half the size of the convential type motor, and weighing less by approximately 30 per cent, yet retaining all the necessary characteristics of sturdiness and power requirements.

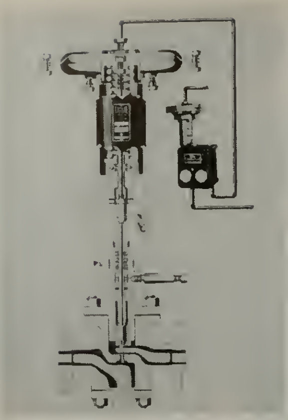
Other features are the simplicity and speed with which this motor can be inspected, cleaned and lubricated; a cooler rotor; much greater acceptability as flange-mounted motor with less overhang for unlimited machine application. Machine designers are enthusiastic over this new motor because it is particularly adaptable to mounting on machine tools, gear units and other machines where compactness and a streamlined appearance are essential factors.

Axial Air-Gap Electric Motor.

LESLIE CO. NEW DIAPHRAGM REGULATING VALVES

Leslie Co., Lyndhurst, N. J., announces new design features in their Class DL and DLS Diaphragm Regulating valves with Conden-Seal cooling bonnet for use with air or water operated controllers.

Salient features include: single



New Leslie Diaphragm Valve

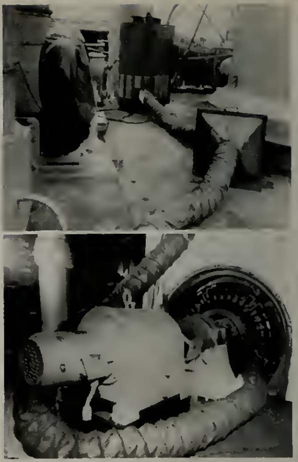
seated, tight closing main valves; hardened stainless steel valves, stems and guides, and integral hard surfaced seats; valve-above-seat position for reverse or direct acting valves; easy reversal of valve action by a simple change of diaphragm superstructure; Conden-Seal cooling bonnet which includes a stainless steel radiating tube and a condensate reservoir for steam service to protect the low friction packing gland at temperatures above 450 deg. F.; sensitive diaphragm assembly which maintains constant effective area throughout travel.

The Class DL is available in semi-steel (125 lb. flanges) or bronze body (300 lb. flanges); the Class DLS, in cast steel (600 lb. flanges). Suitable for steam pressures up to 600 psi. and temperatures up to 800 deg. F. and for pressure drop across the main valve as high as 300 psi. in the smaller sizes.

Todd Develops Manufacturing Aid

The Todd Shipyards Corporation announced that its Combustion Equipment Division has perfected a machine called THAG—(Todd Heated Air Generator) which produces homogeneous hot air of controllable velocity, temperature, quantity, and pressure. It has already proven to be remarkably effective in speeding up the common shipyard operation of drying ship's motors and engine room machinery which has either been flooded or covered with condensation.

A further use around motors of THAG is in connection with cleaning and painting. Through usage, main propulsion machinery and auxiliary motors acquire a thick coating of grease mixed with carbon dust. After a time this coating becomes quite thick and is difficult to remove. By applying hot air at about 200 degrees F. to the part, the grease dissolves readily and the area can be rapidly washed with carbon tetrachloride which evaporates quickly. After a cleaning it is customary to paint the exteriors of electrical equipment with a special varnish which must be baked to give it a hard and longer-lasting protective finish. This operation, formerly done with infa-red lamps, is now accomplished much faster and cheaper with THAG, the controlled hot air generator.



THAG (Todd Heated Air Generator) is set up on the main deck of a freighter, with an 8" canvas, heat-resistant hose extending from its outlet. Top view shows the end of the snake-like hose, directs its stream of intensely hot air directly against a section of the ship's motor which has been flooded. The hose may be interrupted at various places along its length with extra outlets, so as to dry several parts of the machinery simultaneously.

The machine comes in two sizes No. 1, with a capacity of 350 deg. F., and a pressure of 1000 c.f.m., and No. 10 with a capacity of 350 deg. F., and a pressure of 10,000 c.f.m.

All-Plastics Boat Displayed For First Time

A one-piece all-plastic boat believed to be the first of its kind ever molded completely of synthetic materials was shown for the first time by the General Electric Company at the Second Annual Plastics Exposition in Chicago. The boat has been produced by the G-E Plastics Division for the Beetle Boat Company of New Bedford, Mass.

Molded of a glass matt material and a plastics resin, the nine-foot

General Electric Plastic Boat

dinghy weighs only 80 pounds and can be handled easily by one person. The boat can be molded in about two hours time. The new boat known as the Beetle PG-9, has both tensile and impact strength greater than any similar boat of other materials, weight for weight. Its molded plastics seats and gunwale incorporate a plastics foam which gives a permanent buoyancy to the boat and permits accommodation for five persons easily, it was stated.

Beetle Company stated that the PG-9 has exceptional maneuverability and may be used wherever any small craft is desired. Outboard motors may be easily attached.

Penflex Flexible Hose & Tubing and Plastiglaze

The Pennsylvania Flexible Metallic Tubing Co. Philadelphia, is markering under the name of Plastiflex a new type of flexible metallic hose. This unique hose consists of the standard Penflex 4-wall interlocked hose, tightly covered with a new type of plastic that is extremely resistant to harsh abrasion and severe wear. Even when subjected to direct contact with a motor-driven wire brush, little or no effects were indicated after receiving this harsh treatment.

Another new product is anti-corrosive protection in the form of Plasti-glaze, which has been developed to protect Penflex products against corrosion to a degree never before attained. Results of recent brine and acid tests indicate no effect on this new type of protected hose, making it ideal for use where chemicals and other corrosive liquids are present. Plasti-glaze also provides long-lasting service while under exposure to salt air and extreme weather conditions.

Left to right: H. L. Boetsch, VP & Sales Manager; D. M. Williams, Pac. Div. Manager; E. J. Ronan, Executive Vice President., all of the Pennsylvania Flexible Metallic Tubing Co.

The Pacific Division of Penflex Sales Company, Division of the Pennsylvania Flexible Metallic Tubing Company, is at 630 S. Clarence Street, Los Angeles.

FUEL OIL TREATMENT a new 4-page Bulletin #E-57 presents Elraco Soot and Sludge Remover, a liquid fuel oil treatment which cleans fuel systems from storage tank to burner tips and reduces fireside cleaning to brushing or blowing. For Free Copy, write to Elraco Engineering Company, 732 W. 58th Street, Los Angeles 44, Calif.

HOT OFF THE PRESS—

A NEW SECTION OF SPERRY GYROSCOPE MARINE sales catalog devoted to marine radar has just been published by Sperry of Great Neck, New York. The section, singly identified as "Publication 23-220," not only describes the operation of the equipment and outlines its specifications but also describes its three roles as pilotage aid, position-indicator and anti-collision aid. The catalog is generously illustrated with photos, sketches and diagrams in black-and-white and color. It is available on request.

THE NATIONAL SUPPLY COMPANY'S Superior Engine Division has issued a new 28 page bulletin describing all models of the company's marine diesel engines. The new bulletin describes and illustrates how Superior marine diesels are designed and built, both main propulsion engines and auxiliary power engines in all types of ships. The bulletin carries 48 photographs, 8 performance charts and 5 blueprints, and copies of bulletin No. 4704, may be obtained by addressing this magazine.

NEW DATA ON LOW-TEMPERATURE INSULATION is the subject of a booklet called "Holding Low Temperatures With Better Insulation," which has just been published by the Industrial Mineral Wool Institute. The 24 page manual covers the techniques—the chilling, cooling, and freezing operation, food distribution, industrial refrigeration, and air conditioning; also covers the selection of insulation and what to look out for; data on forms, properties and application methods.

In order to obtain this valuable reference manual it is offered gratis from the Institute at 441 Lexington Avenue, New York 17, N. Y.

ENGINEERING PROPERTIES AND APPLICATIONS OF NI-RESIST, revised, 36 pages, well illustrated. This booklet offered by The International Nickel Company, Inc., New York, gives detailed information on the physical and mechanical properties of this widely used cast nickel alloy. Performance under a wide variety of industrial conditions involving corrosion, heat, and wear is described. Corrosion data for 400 corrosive media are presented in tabular form. Completely indexed.

LAUGHLIN RELEASES REVISED DATA BOOK ON MARINE AND INDUSTRIAL HARDWARE: A newly revised catalog data book No. 140 containing much engineering information has just been released by The Thomas Laughlin Company, makers of a complete line of wire rope and chain fittings. In addition to presenting detailed working characteristics of each product to remove "guesswork" in selecting the proper fitting, Laughlin has included tables and charts which make the catalog a valuable reference book for engineers, architects, riggers and safety directors. The catalog lists many new Laughlin products which round out the regular line to the point where most expensive "special" fittings are now easily obtained as standard Laughlin fittings. Copies may be obtained by writing the Thomas Laughlin Company, Portland 6, Maine.

NEW MARINE BOOKLET HELPFUL IN SHIP TASKS: Oakite Products, Inc., New York, announces the publication of a new, illustrated edition of the Oakite Marine Digest for shipbuilding executives and repair yard personnel, providing helpful, practical data for the efficient handling of 58 tasks in connection with shipbuilding, ship repair and maintenance operations. A special innovation of the new digest is an added section devoted to steward's department. Among the operations discussed are methods for dishwashing by hand or by machine; cleaning galley scuppers; cleaning cabins, staterooms, etc.

Marine Yards Find U Model Joshua Hendy Crane Handy

Shipyards and boat builders find many uses for the Joshua Hendy Type U revolving crane, manufactured by the well-known industrial firm of Torrence, California. This handy, powerful and rugged mobile crane is ideal for lifting small craft and in the larger shipyards for handling heavy members in confined spaces about the ways. For placing superstructure equipment, deck machinery and gear the Type U Crane is just what the rigger and shipbuilder needs in many phases of the job.

Joshua Hendy Model U crane.

Aluminum Kort Nozzle

A 20″ diameter Kort nozzle of cast aluminum is to be fabricated by the Engineering Works Division of Dravo Corporation, Pittsburgh, for the U. S. Engineers. This is the first time, it is reported, that a Kort nozzle will have been made of cast aluminum (usually they are fabricated from steel plate) and the first time a Kort nozzle has been specified for installation on a single-screw utility boat.

Socony-Vacuum's Yachting Charts

Offering yachtsmen accurate information about coastal and inland waters of the United States, a new series of cruising guides has been prepared by Socony-Vacuum Oil Company, Inc., for distribution through the company's Mobilgas-Mobiloil marine dealers and its marine sales department at 26 Broadway, New York.

Six of the guides, which were ready in June, are to be followed in several months by four additional guides. All are in four colors and are being made for Socony-Vacuum by Rand McNally and Company.

The guides have been designed to make it as easy as possible for the yachtsman to plan his cruises. The maps show the locations of light houses, buoys, important yacht clubs and Coast Guard Stations. The coastline is depicted in detail, with large inland cities as well as coastal cities and towns being indicated. Other aids to navigation include the true compass course and distances between popular cruise harbors.

Socony-Vacuum's first three guides cover the Atlantic coastal waters and the next three take in the area along the Pacific from Ketchikan, Alaska, to San Quintin, Mexico.

Areas covered by the first six guides are: No. 1, Eastport, Me., to Block Island, R. I.; No. 2, Block Island to Sandy Hook, N. J., including Long Island Sound and New York Harbor; No. 3, New York Harbor to Cape Henry, Va., including Delaware and Chesapeake Bay; No. 7, the Pacific Coast featuring Puget Sound and the Columbia River; No. 8, the Pacific Coast featuring the San Francisco area, and No. 9, the Pacific Coast featuring Southern California.

Guides to be published later will be numbered 4, 5, 6 and 10 and will cover additional areas, including Florida, the Gulf coast and the Great Lakes.

Wetter Water For Fire Fighting

American-LaFrance-Foamite Corporation of Elmira, N. Y., has just announced a brand new product called Pentrate for making water wetter for the fighting of fires. When applied on a subborn, deep-seated, smouldering fire, Pentrate gets to the heart of the fire in a hurry!

This new formula is scientifically compounded of chemical ingredients, 1 per cent of which, when added to ordinary water, gives the combined solution speedy penetrating and spreading qualities much superior to water itself, and more effective in fire fighting. Pentrate is no more injurious to metals or wood than water, and it has even less corrosive effect than water—also can be used effectively with salt water or calcium chloride solutions.

REPAIRS TO WELDED SHIP HULLS

(Continued from page 49)

Similarly the ships bulwarks are not designed to be a part of the monolith, and should never be so welded to the hull as to make it possible for them to take the major longitudinal stresses, or failure will occur in the same way. New deckhouses, if of any appreciable length, should be designed so that they do not integrate themselves into the monolith of the hull. A riveted deck connection is advisable for all new houses. These examples are some of the ways in which improper changes of section can be introduced.

There are many ways in which rewelding may introduce stresses which were not present in the original structure. A simple example is a shell butt as shown in Figures 1 and 1-A. If the butt weld is cracked the specification may read "vee out and reweld." If this is taken literally the new weld will be under severe restraint at the seam and the shell plating will not be able to stretch enough to accommodate the shrinkage of the new butt weld. In order to provide the requisite elasticity the seams should be released about a foot to either side of the weld. This provides a tongue or flap of plate which can stretch, helping to relieve the stress of the butt weld. After the butt has been welded the seams can be closed again.

Figures 2 and 2-A show the correction of a fractured sheer strake butt. In this case we have illustrated one of the most prevalent causes of fracture of this type, namely an undercut weld at the top of the sheer strake causing a depression in the material at a very critical point. This creates a notch which focuses the stress and provides an excellent crack starter. It will be noticed that the same principle of providing a stretching tongue is utilized in the repair of this sheer strake butt. Care must be taken that the depression at the end of the butt weld is not repeated.

Figures 4 and 4-A show another typical failure where rectangular slots have been cut in the sheer strake for freeing ports and other purposes. Here again we endeavor to stop the propagation of the crack by means of a drilled hole and eliminating the right angle corners by cutting back the sheer strake in such a way as to cause the stress to flow in a smoother pattern eliminating concentration at the corners.

Figure 5 shows the crack in the bilge strake which has been caused by a continuously fastened bilge keel. As previously explained, this bilge keel was not designed as a portion of the ships girder and transferred the stress improperly to the bilge plate. If this crack were to be repaired it is obvious that we would be repeating the fault. It is, therefore, important that the bilge keel be released in way of the crack by notching or slotting which will provide a chance for the bilge keel material to stretch independently and will, in a certain measure, disassociate the bilge keel from the shell at least at this particular point.

Figure 5-B shows a preferred attachment of a bilge keel in which a scalloped edge is fastened to the shell. It is obvious that this type of construction will permit the bilge keel to stretch independently of the ship and consequently not force it to take stresses for which it was not designed.

Figure 7 shows a more extensive damage of shell plating such as happens in case of collision. The damaged plating and frame should be burned out clear of the damaged area. Particular care must be taken in locating the new butts so that they are clear of existing butts. All seams must be released and at least 12″ from any new butts before the new plating is added. It is also desirable, wherever possible, to incorporate a small radius at the corner where burning out the damaged section.

Figure 8 shows the sequence of welding in a damage of this kind. The new frames are first erected and tacked and face plate and butt welds completed at lower ends of frames. The frames are clasped at the top of the existing structure permitting them to move in a parallel line. Plate A is then erected and tacked into position and welded in the following order: Butt 1A, seam 3A, and butt 2A. This obviously allows this panel to move with its ends unrestricted. Plate B is then erected and tacked and welded in the reverse order, namely—butt 2B, seam 3B, and butt 1B. This creates a movement opposite to that developed in welding Plate A. This process is followed throughout the rest of the construction.

Figure 10 shows a crack in the stringer plate at the sheer strake, The technique is similar to that previously explained which is stopping the crack by means of the drilled hole, releasing the end of the crack by opening the connection to the sheer strake and welding first the crack and then the connection to the sheer strake. This is a common failure and may be associated with the failure of the sheer strake previously discussed. This repair is a combination of the principles previously discussed, bringing out the necessity for release of the restraint of the seam and the methods adopted for stopping the crack. The welds are made in the sequence shown by the encircled numbers.

Figures 12 and 12A show the damage condition where the shell plating has been bent and fractured and the floor plating has been buckled. The damaged section of the floor and shell plate must first be burned out, incorporating the radius at the corners. A new plate is then fitted to the floor and lap-welded as shown. A new portion of the shell is then fitted and welded according to the sequence shown in Figure 12B.

Figure 13B shows that the butt at one end is first welded, the new plate then attached to the repaired floor, the seam connections welded, and the butt at the other end finished. The principle of allowing the steel to move is quite apparent.

Figure 15 shows two different types of bulkheads damaged at the sides, horizontal and vertical plating bulkheads are shown. The damaged area should be burned out and a new plate added. The sequence of welding should be as follows. All stiffeners, if any, should be welded to the new plate leaving about 12″ free at each end temporarily. The new butt should be welded starting at the center working towards either end, again leaving about 12″ loose at the top and bottom of the butt. The connection to the shell should then be welded starting at the center and working towards either end, again leaving a foot of open joint at top and bottom. The connections to the tank top and underside of deck start at center and work towards either end, leaving the

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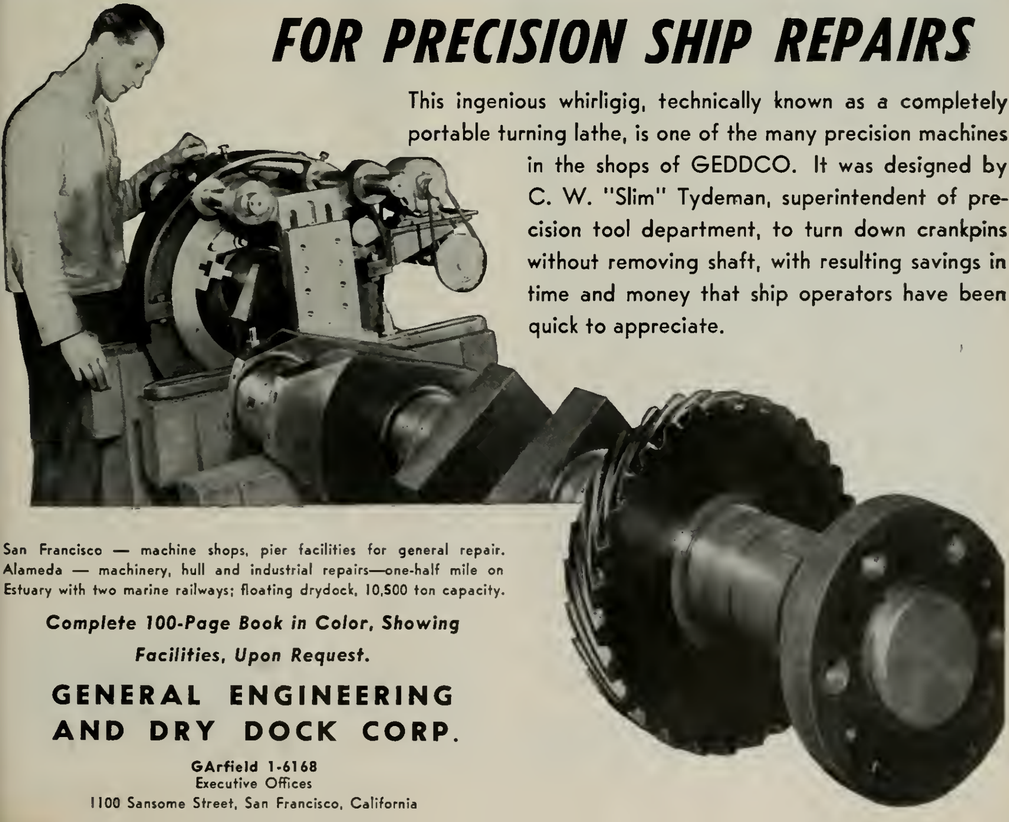


"Roll Welding" Technique

This photograph shows an excellent example of the technique of "roll welding." A block and fall is rigged at each end of the 6" pipe line being welded. By unwinding, the pipe is turned, allowing the welder to work in the flat or downhand position, thereby increasing the speed of operation and assuring sound welds. The weld is being made with Airco 78E all-position electrodes.

(Photo courtesy Air Reduction Sales Company)

REPAIRS TO WELDED SHIP HULLS

(Continued from page 96)

customary foot loose at each end. The welding should now be completed at the ends of the stiffeners and at the ends of the plate joint. This procedure retains the freedom of the panel structure until the very last moment.

A sufficient number of illustrations of the principles involved in repair of welded ship structure has been given so that sequence and methods could be developed for any variation of these conditions. In discussing the causes of welding failures we have purposely left out the question of the so-called "notch-sensitivity." This is a metallurgical term which describes the peculiar property of steel which seems to make it particularly sensitive to fracture emanating from relatively small notches or discontinuities. The theory of discontinuities which we have discussed also applies here. There is a research program now going on with the object of determining the possibility of developing a steel which might have better characteristics in this particular sense. This means the procurement of steel which will better resist cracking or the propagation of a crack in hull structure. In any case, the problem that we face is not only the procurement of a steel for ship construction which will not be susceptible to brittle failure within the operating range of temperatures, but what is more important, we must determine an appropriate simple method of sampling steel to insure the procurement of such desirable properties. What, if anything, will have to be sacrificed in other characteristics to obtain better notch strength will have to be determined. In any event, the question of material is something which lies somewhat outside of the province of the person who has to make the repairs at the moment. It is believed that we should endeavor to use the material which we now find on hand to the best advantage.

To sum up what we have previously stated, it is apparent that the welded ship has different inherent characteristics structurally from those with which we are familiar through years of contact with the riveted ship, that we have to take these characteristics into account building ships and in making any repairs. The principal things to be watched are continuity of structure, points of restraint, and proper welding quality. If these things can be kept in mind it is apparent that welded ships can be kept running and that we can derive the many other advantages such as increased dead weight, better resistance to collision, lower maintenance costs, from these ships without running any danger of failure.

The shipbuilding industry and the various approval agencies cannot consider this problem completely solved at its present state but must continue the many lines of research which have been opened up by the investigations of the Board. An organized, coordinated program of research on design and construction of ships must be carried on continuously if we are to maintain our position in worldwide competition. Such work is being continued by the Ship Structure Committee which is composed of representatives of the same agencies who were members of the Board whose final report is discussed herein. Their efforts should receive the hearty support of all concerned with the American Merchant Marine.

Much has been done—more remains to be done.

REDESIGN FOR POSTWAR TRAVEL

(Continued from page 50)

access from the public space; a spacious business office and a file room were provided; and at the rear an attractive office for the New York manager and a conference room were made out of exceedingly unlikely quarters.

The partition between the reception room and business office was set at an angle to face the elevator, and the visitor entering sees before him, built into this wall, a large map of the world etched deeply on plate glass and tinted. A specially designed lighting recess behind this glass map provides brilliant indirect lighting from concealed fluorescent tubes. The meridians and parallels are marked with aluminum bars, and the Round-the-World route of the American President Lines is marked with a line of brilliant red plastic. Above the map, the company name is set in red free-standing letters.

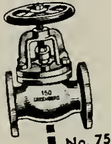
The heavy draperies in the reception room are carried above the ceiling, which is set back to form a light pocket from which a line of concealed fluorescent tubes shine down the curtains with striking effect. The draperies are white and gray Fiberglas, the walls are painted a muted gray to match the gray of the draperies. The entire room is carpeted with a cool green grospoint. Flush spotlights in the ceilings illuminate the desks and lounge area, but the general lighting, largely from the glass map and the top of the draperies, is purposely kept sufficiently subdued to enhance the effect of intimacy and luxury which has been successfully achieved in the decor.

Because the clientele of this office is largely feminine, special attention was given to the lady's powder room. It is papered with a delicate design in black, white, and dark green on a light-gray ground, and has a large

(Please turn to page 104)

No. 763

Bronze O S & Y Rising Stem Wedge Disc GATE VALVE
Especially suitable where fluids might affect inside threads. Constructed with high safety factor against pressure and operating strains. Standard sizes, 1½" to 10", 150 pounds pressure. Sizes 6" and larger have renewable seats. No. 763 flgd; No. 765 screwed.



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MARINE ANGLE VALVE
Bronze 150 pound hose valve with non-metallic disc, bolted bonnet, O S & Y. 1½", 2" or 2½". With cap and chain. Screwed angle, No. 775. Flanged angle, No. 774.

No. 1064

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Non-rising stem, solid wedge disc. Large stuffing box, asbestos packing. Screwed type with cap and chain. Sizes 1½" and 2½". No. 1064.

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Maritime Commission approved V-2000 type ship for Round-the-World Service.

BIDS OPENED FOR V-2000 ROUND-THE-WORLD SHIPS FOR A.P.L.

THE MARCH PACIFIC MARINE REVIEW contained a detailed technical article, with inboard and outboard profiles, deck plans, and machinery arrangement plans of five proposed combination passenger cargo vessels for American President Lines' Round-the-World service. The technical description, deck plans, and machinery arrangement plans will be republished in the November issue of this publication.

Bibs were opened in the Office of the Maritime Commission in Washington, on October 3. Four bids were received.

Newport News Shipbuilding and Dry Dock Company was low bidder at $9,690,000 for each of three vessels. Second low bidder was New York Shipbuilding Corporation, followed by Bethlehem Steel Corporation, Shipbuilding Division, New York, and by Ingalls Shipbuilding Corp., Pascagoula, Miss., with the high bid of $12,932,748 per vessel.

There are five vessels in the bid proposal. They are known as the V-2000 and are to replace five combination passenger-cargo liners taken over by the Navy at the outbreak of war and not returned. The new vessels will be larger, both in passenger and freight accommodations, to take care of the expanding Round-the-World trade, and will fulfill a portion of American President Lines' progressive postwar plans.

Just prior to Pearl Harbor, American President Lines had taken delivery of seven new de luxe President Liners for their Round-the-World service, rated by the Maritime Commission as one of the essential American flag services.

All seven of these fast new liners—known as the C-3-P type—went to war, and only two returned—the President Polk and the President Monroe. These two vessels, reconverted to commercial use, have since been operating on a limited and unbalanced schedule around the world, each with accommodations for only 98 passengers.

American President Lines' contract with the Government for servicing of the strategic Round-the-World route specifies the operation of a minimum of seven combination passenger-cargo vessels. Construction of the five new ships will bring the globe-circling fleet up to required quota and enable the company to meet the heavy traffic demands from shippers and travelers over this route. For a time this essential new construction appeared threatened by a slash in the Maritime Commission's budget.

The Maritime Commission's action in aproving the call for bids followed receipt of an application for differential subsidy aid in the construction of these ships by the American President Lines, Ltd., who will purchase them outright from the Commission.

Details of the V-2000's are:

Length: 536 feet over-all—44 feet longer than the C-3-P-s

Beam: 73 feet

Speed: 19 nots, cruising

Passengers: 189, all first class. This is 103 more than was carried by the C-3-P's

Gross Tonnage: 11,250 tons

Deadweight Tonnage: 11,660 tons.

WORLD TRADE —

The Girl of The Month

(Continued from page 57)

volunteer war work and a weekly radio program entitled "Today's Career Women," which she wrote and presented on the air. For this program she interviewed outstanding women who came to San Francisco, such as: Marjorie Lawrence, Jan Struther, Elizabeth Pickett Chevalier, Marion Anderson, etc. and wrote up the story of their lives, stressing how they had achieved their success and fame.

In her volunteer work, Miss Gerke attended the Press Conferences given by the British Information Service for important British officials who came to San Francisco, took down in shorthand what they said, and typed it up for the B. I. S. Two treasured souvenirs of this work are the autograph of Prime Minister Clement Attlee, received when he was in San Francisco as a delegate to the United Nations Conference; and a letter from the Australian Government thanking her for the very excellent job she did in providing a transcript of the Australian Prime Minister's press conference in San Francisco. This was later used in London at the Prime Minister's Conference.

On January 15, 1946, Roberta Gerke became director of Public Relations for Globe Wireless Ltd., a subsidiary of The Robert Dollar Co. The excellent way in which she filled her position with Globe Wireless impressed R. Stanley Dollar, president of both companies, and he requested that she also handle the public relations for The Robert Dollar Co.

The colorful life of Captain Robert Dollar, his rise to fame and fortune from a cook's helper in the backwoods of Canada to one of the most influential shipping men in the world, known and revered as the "Grand Old Man of the Pacific," made fascinating material for stories and Miss Gerke used it to good advantage. Reading his Memoirs and looking through the worn leather Bible he always carried with him, and from which he read a chapter each day, made her realize how greatness is achieved.

Miss Gerke is a member of the following clubs:

Women's National Press Club, American Association of University Women, English Speaking Union, San Francisco Advertising Club, and the National Writers Club.

COMMENTS ON THE BRITISH LOAN

(Continued from page 58)

the total purchase, or $62,000,000 and 152 per cent of the dollar currency used for ocean transportation by American ships.

(8) It is also interesting that $615,000,000 of United States currency was expended in purchases in other parts of the Americas, which nations were unwilling to take sterling for their exports but required dollar exchange which they could in turn use in purchasing their requirements in the United States market. During the same period large expenditures of dollar exchange were made by Great Britain to other European nations for food and other purchases for the same reasons.

(9) Mr. Dalton does not make a single reference to ocean transportation costs. He explains the heavy drafts upon the loan as due to: (a) increase of between 40 per cent and 50 per cent in commodity costs in the United States since the loan was concluded; (b) "a setback to our hopes of the export drive"; and (c) the speedy growth in dollar starvation all over the world. His explanation shows the necessity for British purchases with dollar currency in countries other than the United States.

The American people favor every reasonable effort to assist in the recovery of the devastated European nations. This should, however, represent the generous effort of the whole American people and should not be a disproportionate burden upon coal, wheat, flour, railroad or shipping industries because they are more directly involved in the relief effort.

The new RCA Exhibition Hall at 36 West 49th St., New York City,, includes among its features an educational display of Radiomarine services and products including a map showing the location of service stations and coastal stations, shipboard loran, merchant ship radio direction finder, 3.2-centimeter radar, and a 25-watt small craft radio-telephone and radio direction finder. A colored panorama of New York harbor painted on the back wall of the exhibit gives the spectator the feeling that he is on the bridge of a ship. The RCA Exhibition Hall is a permanent entertainment feature open daily to the public.

New Company In San Francisco

The Bay Equipment Company of San Francisco has recently opened facilities at Pier No. 3 to handle valves, thermometers, fuel oil burner parts, pressure vessels, tanks, chain, and other marine supplies, including the complete line of the Saracco Tank and Welding Company, San Francisco manufacturers of gangways, booms and other steel products.

Heads of the Bay Equipment Company of San Francisco are: Alan H. Scurfield, former manager of the Charles E. Loew Company; Ted S. Jerstad, who was with the U. S. Maritime Commission; and Hammel Dahl, until the end of the war, and later connected with the Terco Equipment Co.; and L. W. Vivell, limited partner, who was formerly associated with Vivell & Thomas, insurance brokers and average adjusters. Samuel E. Nelson, who recently joined the organization was with the Bethlehem Steel Company for six years.

The four men are experienced in marine engineering and well known on the waterfront.

Eastern District Offices Of General Steamship

Appointment of district representatives of New York City and Washington, D. C., is announced by Harry S. Scott, president of the General Steamship Corporation.

William G. Deverall immediately assumes the post in New York City and will have his headquarters at the offices of the company's agents, Texas Transport & Terminal Co., 52 Broadway. As Washington representative, the company has appointed William J. Spurrier, who is opening offices at 1737 H Street in that city.

General Steamship Corporation handles nine distinct steamship lines serving principal Pacific Coast ports in the trades with Continental and Mediterranean Europe, South and Central America, Australia, South Seas, South Africa and the Orient. Its head office is located at San Francisco, and it maintains branch offices, in Los Angeles, Portland Seattle, and works through an affiliation, the Empire Shipping Company in British Columbia.

New De Laval Los Angeles District Manager

Harvey A. Mylander has been appointed district manager for Southern California and Arizona for the De Laval Steam Turbine Company, Trenton, New Jersey. Announcement of the appointment, effective September 1st, was made by H. V. Petersen, De Laval sales manager.

A mechanical engineering graduate of the University of Arizona, Mr. Mylander has had wide experience on the Pacific Coast and western states in the application of heavy industrial equipment. He was formerly associated with the General Electric Company and the American Hoist and Derrick Company. Previously he spent several years as sales engineer for the International General Electric Company in Venezuela.

Headquarters for Mr. Mylander and Robert D. Doepken, sales engineer, will be maintained at De Laval Steam Turbine Company, District Office, 124 West Fourth Street, Los Angeles, California.

Harvey A. Mylander, district manager for Southern California and Arizona for De Laval Steam Turbine Company.

J. H. Bell, sales manager of Foster Wheeler Company's Dallas District.

J. H. Bell In F-W's Dallas District

J. H. Bell, assistant vice president of Foster Wheeler Corporation, and head of the public relations and advertising department in addition to his regular sales work, has been appointed sales manager of the company's newly-created Dallas District.

Making his headquarters in Dallas, Mr. Bell will be in charge of a district that embraces parts of Texas, Oklahoma, Mississippi and all of Arkansas.

Mr. Bell has been with the organization since 1923 and in July 1935 was made sales manager of the New York sales district, in 1936 he was appointed assistant vice president, and in December 1942, he became the company's liaison with the War Production Board, Rubber Reserve, Petroleum Administration for War, and the Army Ordnance Department for all the company's petroleum refinery division contracts.

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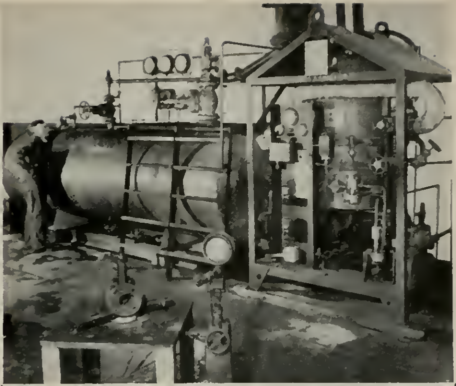

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REDESIGN FOR POSTWAR TRAVEL

(Continued from page 98)

mirror over a built-in dressing table of black Formica. Polyplastex shades flatteringly tint the fluorescent lights.

The large business office was simply treated with an acoustical ceiling, brilliant fluorescent lighting, Venetian blinds, and a floor of dark asphalt tiles. Smart, modern, steel office furniture replaces the antiquated prewar equipment.

Two dark and dingy areas at the back were transformed by furred-out walls enclosing a collection of odd pipes, a hung acoustical ceiling, and brilliant lighting from Holophane trough fixtures. One useless window was blocked up and the other covered with a Venetian blind and draperies. Spaciousness is enhanced by a Flutex glass curtain wall between the two rooms. The conference room has a cork wall for the display of maps and ship plans, and this wall is lighted by goosenecked spotlights. The conference table, desk, and chairs of these rooms are in light natural maple; the walls are light gray; and the carpet is a green grospoint.

The acid test of any good design program is favorable public reaction, and Mr. Teague would be the first to insist on this. But the final measurement will come in a more practical form: the upgrade barometer of more travel bookings, more efficiently handled, on American President Lines' business score cards.

FLOATING AIRDROME

(Continued from page 89)

formed of a special grating developed by Supergrate for this application.

Passengers debarking from the airplane will descend a ramp from the turntable level to a modern waiting room on the main deck level at the after end of the barge. Side doors from the waiting room open directly to the shore boat. An office, radio room, rest rooms, and ladies' lounge complete the facilities of the deckhouse on the main deck level. Bulkheads and overhead will be ceiled with attractive sheathing of Johns-Manville Marinite. Deck covering will be Dex-O-Tex. The waiting room will be lighted by fluorescent fixtures installed flush with the ceiling.

A stairway at the after end of the waiting room will lead to the deck overhead, which will be an observation deck from which the public may watch the landing operations and other activities in Avalon Bay.

At the forward end of the observation deck, a control tower will be installed from which all operations may be directed.

In addition to the permanent ballast and water ballast tanks, an engine room will be constructed in the hold of the barge. Access to the engine room will be located under the stairway which leads up to the observation deck.

Two 10kw-110 volt, 60 cycle Buda diesel generating sets, either of which will handle the entire load, will furnish power for the barge. A salt water pump, which will supply water to the sanitary system gravity tank, the fire main washdown, and which will handle water ballast to adjust the trim of the airdrome; a bilge pump; a fresh water transfer pump; and operating gear for the turntable, will complete the engine room installation. All these units will be electrically operated.

The wooden deck of the barge beneath the turntable will be protected against the absorbtion of gasoline, oil, and grease by Dex-O-Tex laid directly on the wooden deck. A permanent CO_2 fire extinguishing system will be installed under the turntable. This will be operatable locally from stations on the main deck and from the control tower. In addition to this, a number of portable CO_2 extinguishers will be located throughout the barge and in the engine room. A sufficient number of life jackets, life rings, and other safety devices will be provided.

THE RULES OF THE NAUTICAL ROAD

(Continued from page 70)

the danger signal is to be used not only in clear weather but also in fog. It should be used, therefore, by any vessel whenever approaching fog signals of another vessel seems to indicate a close possibility of collision.

12. It has been decided that the capable ship's officer must be able to estimate the probable course of a sailing vessel in a fog when he cannot see her by comparing her fog signals with the direction of the wind. Because the sailing vessel is not in sight, her type is not known; therefore as a general rule it is assumed that she can sail as closely into the wind as four points. This generality allows for even the trimmest of sailing craft. Thus, if the wind is South and one blast of the foghorn is heard, it is assumed that the vessel may be heading anywhere from East to Southeast. With the same wind, hearing a two blast signal, the vessel may be heading anywhere from West to Southwest. With the same wind and hearing a three blast signal the vessel may be heading anywhere from a little north of East through North to a little north of West.

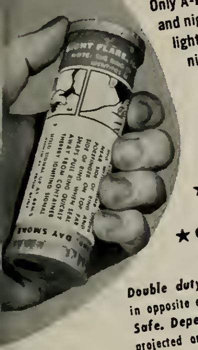
Navigating in a Fog

Upon approaching a fog bank, good seamanship as well as the rules of the road require the navigator to take several precautions that will insure the safety of his vessel and comply with the law. These are: (a) *Inform the Master.* It is the duty of the Mate on watch to inform the Master immediately whenever the vessel nears a fog bank. (b) *Inform the engine room and reduce speed.* When running into fog, place the engine room on standby, and reduce speed to moderate speed. Call up the Engineer on watch and inform him that you are running into fog, and that at any time it may be necessary to stop or reverse the engines. Engineers, when on watch, are not always standing by the throttle, and might be down in the bilges or busy in the machine shop. (c) *Post your lookouts.* It is required in thick weather that a lookout be maintained as far forward and as low down as possible. If the weather has been clear, it is an understood fact that your watch will be chipping or painting, rather than standing a lookout. Accordingly, blow your whistle to call your watch *right now*, don't wait to see if it is "just a little fog drift" that the vessel will be through in a couple of minutes. Send your lookout forward to the bow *immediately*.

(d) *Obtain a fix of your position, if possible.* It is to your great advantage to know the position of your vessel at all times, but especially is this true if you are in a fog. Your vessel not being equipped with Loran, if you are near the coast it may be possible to obtain a fix before entering the fog by beatings of points of land or landmarks. If you are out of sight of land, it sometimes is possible before entering a low lying fog bank to obtain a sight.

(e) *Start sounding your fog signals before entering the fog.* Good seamanship would demand that the very sensible sug-

(Please turn to page 106)



THE RULES OF THE NAUTICAL ROAD

(Continued from page 104)

gestion of La Boyteaux be followed. According to his interpretation, fog signals should be sounded whenever proper sidelights cannot be seen for two miles. His argument is completely logical when he states that "Since it is evidently intended that warning be given for at least that distance by the minimum visibility of sidelights being two miles, whenever they are not visible for that distance fog signals should be sounded." This rule would indicate the necessity of using the signals not only when in fog, but when cruising near a fog bank which may conceal another ship.

(f) *Upon entering a fog bank, abide by Article 16.* Four phrases contained in Article 16 are of such importance that a brief discussion of them finds a place in this article.

The first phrase is "moderate speed." Moderate speed has been defined by the Supreme Court as that speed which will enable a vessel to come to a complete stop within one half the distance of visibility. This very obviously is so that the other vessel will have the same distance in which to stop after the vessels see each other. When there is very little or no visibility then moderate speed is interpreted to mean bare steerageway. It is not the purpose of this article to enter into a discussion concerning the necessity of disregarding the speed rule as it is written and interpreted if a vessel is ever to reach her destination while holding to any semblance of her schedule. The navigator should realize, however, that if he finds himself in Court as a result of collision through excessive speed in fog, under the present law any excuse that he may offer will almost certainly meet with a cold reception by the judges. Captain R. F. Farwell, in his critique of the rules, has enumerated several of the excuses and arguments offered and found wanting: "(1) That full speed was the safest speed, as it enabled the vessel to get through the fog sooner; (2) that the speed was customary for liners; (3) that the vessel was a passenger steamer and obliged to maintain schedule; (4) that the vessel was carrying passengers whom it was important to get into port; (5) that the vessel was under contract to carry United States mail; (6) that in the opinion of her officers the vessel could not be properly controlled at a lower speed; (7) that the slowest speed of the engines would not drive the vessel at the moderate speed demanded; (8) that the other vessel was more seriously at fault; (9) that the vessel was a ferry; (10) that the regular speed, or at least a speed faster than that allowed, was necessary to keep track of the vessel's position." If the navigator would obey the law, there seems to be no alternative but to navigate in accordance with the strictest definition of "moderate speed."

The second important phrase of Article 16 is "the position of which is not ascertained." The vagaries of sound in air, especially sound in fog, are well known, and every deck officer of experience has been surprised more than once when he actually sighted the vessel whose fog signal he had been hearing. It would be extremely difficult indeed to convince a Judge that you had ascertained the vessel's position was abaft your port beam and steering away from you after a collision in which she rammed your starboard bow. It is far the wisest course to so act as if you had no idea where the vessel was, and obey Article 16, even though it does *sound* like she bears a definite direction away from you.

The third, and sometimes qualifying phrase of Article 16, "so far as the circumstances of the case admit," is interpreted to mean *immediate danger*, such as if the vessel were very near dangerous rocks, or in a narrow channel wherein the ship could only be controlled by proceeding ahead without stopping her engines. That such danger exists upon occasion is obvious, but since it is extremely rare, any navigator would be wise to refrain from using this phrase as a mental excuse to avoid stopping his engines unless he is prepared to prove that such danger immediately existed.

The fourth phrase to be mentioned, and one that is ofttimes easily disregarded, is "navigate with caution until danger of collision is over." This does not mean by any manner of interpretation that immediately after stopping the engines, with perhaps the signal *seemingly* growing fainter, you should "hook her up" and attempt to make up some of the time the delay in stopping has cost you. This phrase implies *additional* duties, in addition to stopping your engines. These duties could range from drifting on with stopped engines to reversing full speed, depending upon the situation. Also, while there is no rule requiring a vessel to hold course until the other vessel is sighted, it has been decided that a change of course should not be made blindly, just guessing at the other vessel's position, changing course, and attempting to dodge her. Remember also that three short blasts accompany a reversal of engines only if the other vessel is actually in sight. The words navigate with caution until danger of collision is over may have many interpretations, depending upon the particular case, but it is well to remember the saying "The toughest thing in the world is to convince a Judge after a collision has occurred that the danger of collision was over."

NAVY DAY IN SAN FRANCISCO

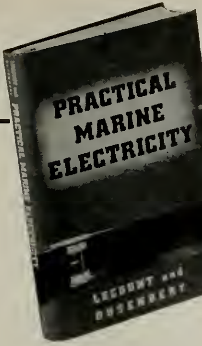
(Continued from page 73)

His work was recognized recently at a ceremony at the S. F. yard when Shipyard Commander Capt. Philip Lemler presented on behalf of ex-Secretary of the Navy James Forrestal a citation which read, in part: "For outstanding performance of duty as Force Maintenance Officer . . . skilled and resourceful, Cmdr. Fee faced unprecedented problems created by scientific requirements of the tests, coupled with the indeterminate damage to be expected from the atomic bomb . . . ably coordinated all requirements and activities in such a manner that all scientific, technical and emergency demands were adequately met. . ."

Among the facilities given over for the new project's use is another wooden, barracks-type building, which is appropriately named the Decontamination Center. Literally and figuratively it is divided into a "Clean" and a "Contaminated" section. It demonstrates one of the problems of carrying on this Navy research work aboard so-called contaminated ships and in connection with materials taken from those ships for study inside the laboratory, it is for the decontamination of scientists and workmen, Navy and civilian personnel alike, even for visiting admirals, generals, Congressmen, and others who might wangle permission from the Navy Department to go aboard the target ships.

At the beginning of each work period, personnel going aboard these ships enter a "Clean" entrance at one end of the barracks, shed their clothing, and pass over a white dividing line into the "Contaminated" area to draw a complete outfit of work clothes plus certain protective articles. At the end of each work period the men who have been on the ships must shed their contaminated clothing and bathe before entering the "Clean" locker room. These constant precautions emphasize the fact that radioactive elements won't be spread around as a result of this lab work.

This special project and Radiation Lab, together with Bikini target vessels and trained scientific personnel, many of whom are still being recruited from leading universities, is one of the Navy's answers to problems created in an atomic age. Much of it, the target ships, official Bikini color films, Bikini observers with their talks and demonstrations of radioactivity, will be on display for friends and visitors to San Francisco Naval Shipyard at Navy Day Open House, Sunday, 26 October.



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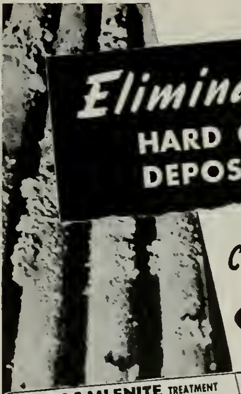

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The Relation of California Agriculture To International Trade

(Continued from page 61)

market. Coffee, bananas, cocoa and such products, of course, do not present a problem.

It must be recognized, however, that conditions change and that industries grow and decline whether in competition with foreign production or not. Where such changes are occurring, particularly if the change results from government action, the whole problem should be explored realistically with a view to helping the industry to make needed adjustments, supporting it if the national interest warrants its maintenance as present levels, and aiding it if need be in periods of abrupt transition. We need to use a positive approach rather than the negative one of fearing all imports on the assumption that they will do us damage. California imports from other states pork, corn, lambs, butter, and many other things and does so to her advantage but that doesn't mean that she wants to import oranges, lemons, raisins, and prunes.

The solutions to these problems will not come easily and will not be simple, nor will they be the same for all types of production. We need to give them our best thought and approach them as open-mindedly and realistically as possible.

Pacific Coast Foreign Trade - July 1947

Customs Districts	Exports (Millions Dollars)		Imports (Millions Dollars)	
	1947	1946	1947	1946
Total Pacific Coast	$93.6	$65.0	$23.2	$23.5
San Diego	3.0	1.8	1.6	.9
Los Angeles	25.0	9.5	7.0	5.6
San Francisco	44.7	32.6	6.9	8.0
Oregon	8.1	8.1	.6	.9
Washington	12.8	10.1	7.1	5.5

China Tightens Trade Controls

The Office of International Trade announces through John J. Judge, regional director, Department of Commerce in San Francisco, further tightening of Chinese temporary foreign trade regulations. Article 9 of the Chinese revised temporary foreign trade regulations promulgated August 18, 1947 stipulates that import licenses should in all cases be obtained by importers before they contemplate purchases or otherwise commit themselves abroad. Chinese press notification of August 21 states that importers are strictly forbidden to enter into purchasing contracts or make shipments of any goods from abroad prior to their obtaining import licenses. Consignees of shipments made in violation of this regulation and arriving after August 17 will not be permitted to take delivery, or alternatively the goods may be taken over by the Chinese Government at a price fixed in accordance with the registered official rate of exchange. Additionally consignees of such shipments being registered importers, their registration shall be cancelled. Provision, however, is made for goods having no import license but which arrived in China before August 16 and for goods having no import license but which can be proved to have been enroute before August 16. Regarding such shipments enroute American shippers should promptly instruct consignees to refer to newly created export import board.

Pacific
WORLD
TRADE

Japanese Trade

Two changes in private trade procedure with Japan are announced by the San Francisco Chamber of Commerce.

Businessmen in the U. S. are now permitted to send business catalogues and descriptive material to Japan and to communicate with their representatives now traveling in that country. Postmasters throughout the country will shortly be advised of the change in these postal regulations.

These two changes in procedure, shortly to be officially announced by the U. S. State Department and the Post Office Department, came as a result of complaints from businessmen throughout the country that they were handicapped in being unable to send descriptive literature to Japan and that no provisions were made for those visiting Japan to have their home offices contact them.

Private trade was resumed with Japan on August 15. That same week nine San Francisco businessmen headed for the Orient to resume Japanese trade contacts.

Philippine Documents

Release of a new Philippine consular form for use by exporters and shippers is announced by the World Trade Department of the San Francisco Chamber of Commerce.

The forms combine the Consular Invoice and Certificate of Origin in one document.

Combination of the two forms into one document was suggested by local exporters and recommended by the Chamber's World Trade Department. It was recently approved by the local Philippine Consulate General and Ministry of Commerce in Manila. Fees for the certification of documents remain the same as in the past.

ADMIRALTY DECISIONS

(Continued from page 64)

the information that won this case—simply that a seaman signed articles knowing that he was suffering from contagious disease and failing to disclose it to the examining physician. The more common case is one where the shipowner is without tangible means of proving, except in a negative way, that no illness occurred aboard the vessel but that the illness actually existed at the time of the sign-on.

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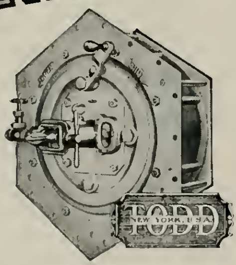

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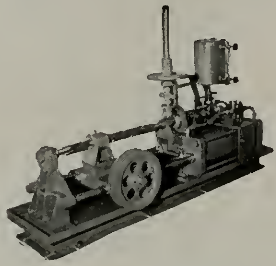


MARINE INSURANCE

(Continued from page 63)

commenced on February 20 of each year. This was largely because the financial year of the Mutual Associations commenced on that date. The arrangement meant that a very considerable volume of English hull business expired early in the year, and it may be that this meant that a hull account had a shorter "tail" than under the present system, when risks attach throughout the whole of the year. Whether it would be possible for the English market to adopt January 1 as the common commencing date for hull risks is debatable.

Insurance On War Seizures

A case arising out of the seizure by the Germans of vessels under construction in Danish yards at the time of the invasion in 1940 is to come before the Danish Maritime and Commercial Court in the autumn. British and Norwegian shipowners are claiming a total of about 50 million kroner (£2,500,000) from the Danish State, the Danish War Risks Insurance (Commodities) Office and three of the largest Danish shipyards. One of these is a claim by the Blue Star Line, Ltd., for about 15 million kroner in respect of the *Adelaide Star,* which was being built by Messrs. Burmeister & Wain. The Blue Funnel Line is claiming compensation of 5-10 million kroner in respect of the *Glengarry,* the defendants being the Danish Ministry of Finance, the War Risks Insurance Office and Messrs. Burmeister & Wain. It is stated, however, that the parties have agreed to await the result of the Blue Star case before taking the case to court. Whereas the *Adelaide Star* was lost from war cause after having been taken over by the Germans, the *Glengarry* was found at Kiel after the liberation and was delivered up to the British. She had then been converted into a semi-warship, and her British owners had to incur much expense to convert her back to her original condition.

The Advisory Board

(Continued from page 46)

vessels be required to remain under American registry and flag for a period of 20 years.

6. Government should undertake to pay for all features of national defense incorporated, including consequential effect, if any.

7. Existing turn-in provisions of the Merchant Marine Act, 1936, should be liberalized to provide a reasonable turn-in value, and the age at which vessels may be turned in be reduced from 17 years to 12 years.

8. Permit the shipping industry to write off its capital investments through depreciation allowances during periods when earnings permit it and to the extent of such earnings.

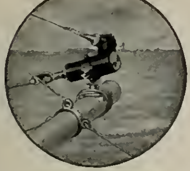
9. Vessels should be designed by or for the shipowner to meet the economics and particular trade requirements of the route, in close cooperation between the Maritime Commission, the Navy Department, and the shipowner.

10. Title V of the Merchant Marine Act, 1936, be clarified to show clearly that the construction subsidy is one to promote American shipbuilding.

11. At the option of the operator, subsidy contracts for services involving pasenger vessels and for strictly cargo services be written separately.

12. The law be clarified, if necessary, to give authority to the Maritime Commission to acept bids on an adjusted price basis, and to adjust bids to add or deduct certain items.

13. Consolidate the administering of laws and regulations relating to shipping, under as few Government agencies as possible.



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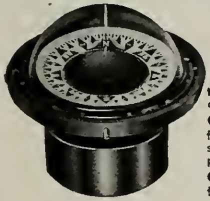

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Harold J. Wrigley and George A. Horton, Jr., San Francisco, appointees of International Paint Company.

International Paint Appointments

Harold J. Wrigley joined the staff of International Paint Company in San Francisco August 14. For the past 13 years he has been connected with Weyerhaeuser Steamship Company, serving as chief engineer on the SS *Hegira, Potlatch, Klamath,* and *Kit Carson.* He came ashore in January, 1943, as port engineer and later as superintendent engineer on the Pacific Coast. Wrigley served his apprenticeship with H. N. Moody, mechanical engineer and power specialist of New Orleans, Louisiana. Later he was Erecting and Operating Worthington diesel engineer. Wrigley started his seagoing days in the Mississippi Shipping Company of New Orleans, and his first licensed position was with the United Fruit Company as 3rd assistant. Later he was with Luckenbach Steamship Company until 1934, until he joined Weyerhaeuser.

Another appointment is George A. Horton, Jr., who joined the company in New York in October of 1945, upon completion of four years of Navy duty. He has spent some time studying in the laboratory at the New Jersey plant, learning the know-how of paint manufacturing before coming to the San Francisco factory in March of 1946. Here again he spent some time in the factory working with the chemists. About a year ago he joined forces with the late Fred Shingle, as his assistant, in drydock work and the soliciting of business.

J. G. Magrath, appointed executive secretary of American Welding Society.

J. G. Magrath of American Welding Society

At their meeting on July 11, 1947, the Board of Directors, American Welding Society, selected Joseph Gordon Magrath for the new position of Executive Secretary of the Society, the duties of which he assumed on September 2, 1947. As the chief staff officer of the Society, Mr. Magrath will work with other members of the National Headquarters staff in directing the activities of this national engineering organization of about 7500 members, whose accomplishments and activities in welding engineering, research and applications are known throughout the world. M. M. Kelly, secretary; W. Spraragen, editor of the Welding Journal and director of Welding Research Council; and S. A. Greenberg, technical secretary, will continue in their present duties.

Mr. Magrath was especially active, while with the Air Reduction Sales Company, in the exploration of welding, cutting, brazing, and other flame-treatment processing of welded fabrication in all of the larger shipyards on the East, Gulf and West coasts, as well as other inland war activities plants and various steel mills. He has been active in the work of the New York Section of the American Welding Society and served for several years as chairman of Publicity and Programs.

OXI Appoints Sopac

George Plant, president of the Sopac Ship Maintenance Company, 1168 Battery Street, San Francisco, announces the appointment of his company as distributors of Oxi Crystals, manufactured by the Oxi Corporation of Gary, Indiana.

Enterprise Head Retires

Charles S. Hoehn, a name long associated with the diesel engine industry, has announced his retirement as president of Enterprise Engine and Foundry Company of San Francisco. Starting as an apprentice with Enterprise 57 years ago Mr. Hoehn rose to the presidency of the company, which position he has held for the past 30 years. During his extended term in office Mr. Hoehn was connected with the design and development of numerous industrial products, which included oil burners and a diversified line of process machinery, in addition to the basic Enterprise line of heavy duty diesel engines. While his retirement will relieve him of active duties as the head of the company, Mr. Hoehn will continue to serve on the Board of Directors and in a special consulting capacity.

Charles S. Hoehn, Sr., retired president of Enterprise Engine & Foundry Co., San Francisco.

Pacific MARINE REVIEW

NOVEMBER, 1947

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Pacific Marine Review

WHO WANTS NATIONAL DEFENSE?

IT IS SAID THAT NATIONAL DEFENSE, like education, is a debt that one generation owes to the next. In the world of today, a strong and continuing Merchant Marine is another such debt, and the link between national defense and Merchant Marine is only now becoming recognized by important segments of the general public and the general public itself.

Perhaps this trend in public thinking is due to the fact that the threat of war is an everyday topic of conversation and is even a guiding motif in many lives. This threat of war is important, and it is having a *present* effect on the shipping industry. Labor in the industry is being warned by its own advisers and leaders that efforts to undermine shipping are being made by enemies of America, as it is recognized that communications and shipping *in constant readiness* are vital to our defense, and keeping them in turmoil is a worth while fifth column objective.

Less easy to understand is the reported lack of unity among operating companies in supporting opposition to destructive influences. True, every company has its own particular interests to safeguard, but we believe they will find such safeguarding easier if they will unite on one grand objective at the top—national defense.

And the scope of our national interest is expanding. The Marshall program for European peace and rehabilitation is very largely based on shipping. Our expectations for benefiting the rest of the world are bound up in our productive capacity, which, to accomplish anything at all, requires shipping.

The Pacific basin has largely been assigned to the United States as a mandate, and a recent Propeller Club speaker pointed out that we can establish a regime in the Pacific that will benefit one-half the population of the world for 1,000 years. But ships, both cargo and combat, will have a big place.

There is no room for subversive influences in shipping labor. And there is no room for weakness or competitive jealousies on the part of management when national defense is threatened. The industry's top leadership is entitled to the confidence and cooperation of all its units.

ECONOMIC CONSIDERATIONS OF PACIFIC COAST-NORTH ATLANTIC CARGO TRADE

By M. J. RYAN, Naval Architect


M. J. Ryan

THE MAIN ITEM OF EXPENSE IN WATER TRANSPORTATION is cargo handling, which includes stevedoring, checking, and cooperage. In 1939, cargo handling accounted for about 45 per cent of all operating expenses; in 1946 it had increased to about 55 per cent of total expenses.

While we may look to an improved ship design to answer many of our cost problems, the greatest concentration of attention should be on more economical cargo handling. Ships should be more specialized and designed to fit a modernized pier.

We have made a careful survey of existing types of Maritime Commission vessels, the C-1, C-2, C-3, C-4 and Victory designs, and it is agreed that the C-3 design fits the intercoastal trade most satisfactorily because of its cargo cubic-deadweight ratio. The Victory ship, for example, has too small a cargo cubic for the deadweight available, and the deep webs and deep transverse beams interfere with cargo stowage.

The C-3, of course, is open to improvements to specifically suit her to the intercoastal trade. For this we propose a modified C-3 to overcome the deficiencies in the original design. The question of speed of the vessel as well as speed of port operations is paramount to economical operation, for we cannot consider a ship as a relatively inexpensive piece of equipment. The daily operation cost of a C-3, including depreciation and administration, may exceed $1500. It is, therefore, obvious that vessels should be moving as fast as possible underway and that port time be held to a minimum.

This can be accomplished by (1) increasing the sea speed to 18 knots, (2) reducing the port time by more efficient cargo handling and (3) reducing the number of ports of call. It is possible thereby to increase the number of round trips on a typical Pacific Coast-Atlantic Coast run from 5 trips to 6 trips per year. The operation expenses per ton of cargo then change in the following manner. Panama Canal tolls, towage, dockage, pilotage dunnage, cargo claims and cargo handling remain fairly constant. The cost of food, repairs, stores, crew wages, administration and insurance become approximately 5/6th of their former amount. The cost of fuel oil is the only item, on a cost per cargo ton basis, that increases, and may amount to a 50 per cent increase. Beyond these considerations is the fact that a more rapid service will attract a higher revenue cargo, and the net effect is more profitable operation since the savings more than balance the extra expenditures.

Preliminary designs have been made for a modified C-3 vessel, indicating that a sea speed of 18 knots is obtainable by changing the vessel's lines slightly and by increasing the horsepower requirements.

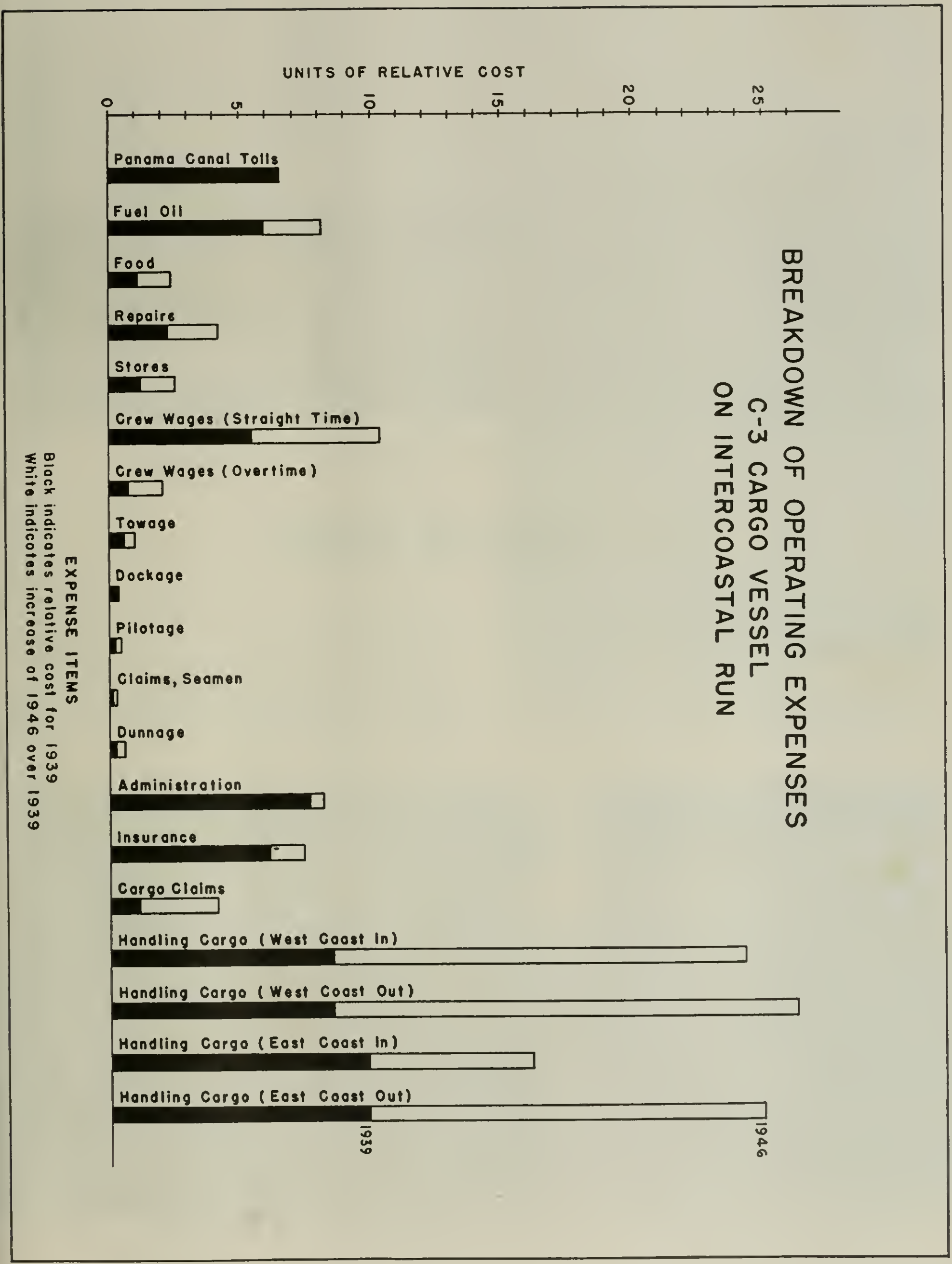
The second way to decrease the days per trip is to eliminate unprofitable ports of call. In other words, the ship is too valuable to be docked at a port for only a few hundred tons of cargo. Small-port service could be more profitably handled on an agency basis and thereby decrease administration costs. Small cargoes may then be grouped and transported by barge or truck to the main ports where the majority of cargo is loaded at a smaller cost per ton. In other words, small volume transportation must be utilized to offset the more expensive cargo ship and thus eliminate the taxi-cab service.

Equally important for economic water transportation is decreasing the expenditures in port. These may be grouped into two major classes: (1) improvement in the ship design to facilitate cargo handling; (2) improvements in cargo handling methods at the pier.

Important steps should be taken to reduce broken stowage in cargo holds (due to deep beams and large web frames) and thus eliminate areas of expensive stowage. Cargo batten clips should not have protruding edges that damage sacked cargo. In fact, vertical cargo battens can be used in many cases to great advantage. Side cargo ports, such as those fitted on the new Moore-McCormack ships (Mormacgulf, etc.) should be fitted to speed up cargo handling by using at least two more stevedoring gangs. The new type cargo ports can be easily broken open. Cargo elevators may also be used economically in conjunction with the cargo ports.

The use of present design pallet boards in the ship

(Please turn to page 90)



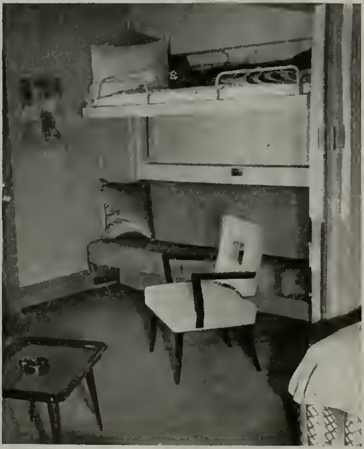
BREAKDOWN OF OPERATING EXPENSES
C-3 CARGO VESSEL
ON INTERCOASTAL RUN

The Corsair arriving in San Francisco after reconversion at Victoria, B. C.

THE CORSAIR IN SERVICE

ENDING ITS COLORFUL CAREER in war service for Great Britain and the United States, the former J. P. Morgan yacht *Corsair* has been completely reconditioned and refurnished to serve as a luxury cruise liner connecting Alaskan and Mexican resort cities under the house flag of Pacific Cruise Lines, Ltd., of Seattle. Some detail of the reconversion was given in Pacific Marine Review, March, 1947.

The Naval Architects for the reconversion, including general arrangement plans, designs and survey, was Joslyn & Ryan, of San Francisco. The shipbuilder for reconversion was Victoria Machinery Depot, Victoria, B. C., and



Typical stateroom.

Main lounge, showing the gyro compass.

the marine interior architect and designer, William Schorn Associates, New York. The architects worked under the supervision of Gil Skinner, of Skinner & Eddy, Seattle, who control Pacific Cruise Lines, and Ray C. Anderson, president of Pacific Cruise Lines, and vice president of Skinner & Eddy. Cruise agent is the Albertson Travel Service.

Since the *Corsair* is to be used as a de luxe cruise liner, ordinary stateroom arrangements and appointments common to most passenger vessels were not acceptable. Within the confines of small space a sense of spaciousness and luxury had to be created. Also the camber and sheer of the yacht presented problems in the designing of built-in equipment.

Since the vessel is operated as a commercial enterprise without the usual governmental subsidies and other bolstering economic methods, the *Corsair* must operate economically and function as efficiently as possible in order to bring her owner a justifiable and attractive revenue.

Built in 1930

The *S. Y. Corsair* was built for the late J. Pierpont Morgan in 1930 by the Bath Iron Works in Maine, at a cost well over two million dollars. She is a 2181-gross ton vessel with an overall length of 343 feet and a maximum beam of 42 feet, and cruises at 16 to 17 knots. She is a twin-screw vessel, each propeller being driven by an electric motor, the current for which is generated by steam turbine-generator sets.

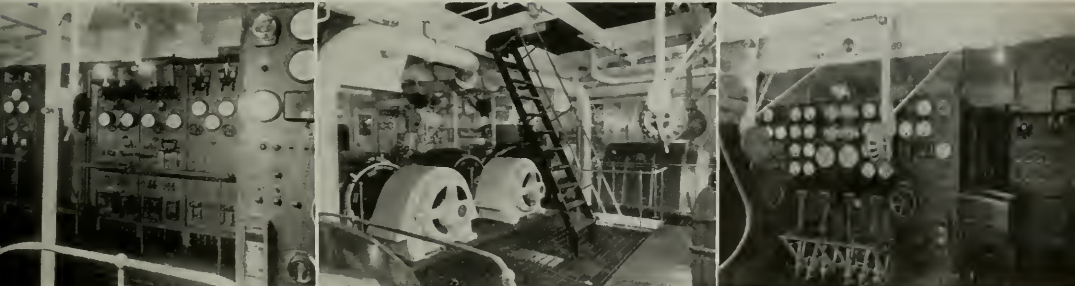
The electric propulsion equipment, built by General Electric plants in Lynn (Mass.) and Schenectady (N. Y.), includes the two main turbine-generator sets, two 3000-hp propulsion motors, and necessary auxiliary apparatus. The engines have been driven over 100,000 miles without experiencing the slightest bit of trouble.

The main and auxiliary pumps are by the Warren Steam Pump Co., and the steering equipment is Markey.

Located at the forward end of the Promenade Deck is the observation room, called the "Gyro Room" because in the center of this space there has been located a specially designed and constructed gyro compass. This equipment has been installed for the interest of the passengers who may observe at all times the movement of the *Corsair* as it wends its devious course through the inland waterway to Alaska, which is dotted with innumerable islands. The gyro compass is constructed almost entirely, as far as its outer covering is concerned, of glass, lucite and satin-finished silver and forms a natural center of interest in the room, particularly at night.

(Please turn to page 102)

Engine room scenes aboard the Corsair. Below the General Electric type MT-28, 3000 hp, 254 rpm, 2300 volt induction propulsion motor in engine room. View is of the forward end.



Below, left: General Electric auxiliary switchboard in engine room. Center: Engine Room, view showing two G-E turbine motor-generator exciter sets, and G-E main turbine generator propulsion set. Right: Main propulsion control board in engine room aboard the Corsair.

V-2000—

A NEW SHIP TYPE

AS THIS IS WRITTEN, the decision of the Maritime Commission on acceptance of bids on the proposed V-2000 vessel is awaited. The bids were far higher than the Commission's estimates made early this year, and it is necessary to project the anticipated costs and revenues into the completion period some two years after start of construction.

There was considerable surprise over the small number of bidders. Such as were submitted for the October 3 opening are summarized below:

		Form 1*		Form 2*	
	Days	Clause A†	Clause B†	Clause A†	Clause B†
Newport News Shipbuilding, etc.					
One vessel	600	$12,350,000	$10,740,000	$12,510,000	$10,875,000
Two vessels	690	11,440,000	9.950,000	11,590,000	10,080,000
Three vessels	780	11,140,000	9,690,000	11,290,000	9,820,000
Bethelehem Steel Co., New York					
One vessel	630	16,641,000	12,798,000	16,881,000	12,975,000
Two vessels	720	15,131,000	11,628,000	15,381,000	11,808,000
Three vessels	810	14,521,000	11,159,000	14,741,000	11,336,000
New York Shipbuilding Corp.					
One vessel	540	14,000,000	12,785,000	14,157,000	12,935,000
Two vessels	630	12,985,000	11,893,000	13,145,000	12,045,000
Three vessels	720	12,408,000	11,387,000	12,569,000	11,540,000
Ingalls Shipbuilding Corp.					
One vessel	630	17,535,757	15,515,885	17,620,416	15,595,282
Two vessels	720	15,415,272	13,691,128	15,501,110	13,768,890
Three vessels	810	14,422,138	12,832,748	14,504,822	12,910,167

*Steam conditions: Form 1, 650 lb., 850 deg.; Form 2, 850 lb., 900 deg.
†Clause A, fixed price; Clause B, price subject to escalation.

Regardless of the outcome of the bids, the V-2000 design is so nearly the perfect ship for the service for which it is intended, that certain of the details outlined in the original announcement in Pacific Marine Review (March issue) are being repeated and amplified here, and the profile, deck, and general arrangement plans are also being repeated in the folded insert.

Characteristics are shown in the table herewith.

Principal Characteristics

Length—over all, about	536′—0″
Length—B. P.	500′—0″
Breadth—Molded	73′—0″
Draft—Maximum Molded	29′—6″
Depth—Molded to Upper Deck at side	49′—0″
No. of Crew (Exclusive of Spare Berths)	158
Passengers—Floor Beds and Sofas	122
Upper Berths	67
Total	189

Cargo Capacities (Estimated)

General Cargo Capacity	424,000 bale cu. ft.
Refrigerated Cargo Capacity	60,000 net cu. ft.
Cargo Deep Tank Capacity	48,000 net cu. ft.
Total Capacity	532,000 cu. ft.

Tank Capacities (Estimated)

Fresh Water	206 tons
Fuel oil (98% full)	2,429
Clean Salt Water Ballast	194
Total Capacity of Tanks	2,829 tons

The hull is of mild ship steel mostly welded and having a stem with a curved forward rake and a modified cruiser stern.

Nine watertight bulkheads divide the hull into ten main watertight compartments. First, starting from the bow is the conventional forepeak; then in order, holds No. 1, 2, 3 and 4; then the machinery space, holds 5, 6 and 7, and last the after peak. Watertight bulkheads No. 1 and No. 2 forward are complete from the tank top to the upper or weather deck. Bulkheads 3, 4, 5, 6 and 7 are complete from tank tops to A deck. Bulkheads 8 and 9 extend from tank top to upper deck.

The compartments thus formed are in turn divided into many spaces for various uses. The forepeak houses the bos'n's stores, the anchor chain locker, a salt-water ballast tank; and a room on the first flat accommodating the motors for two vertical capstans on the upper deck and the resistors for the controls of these capstans and of the anchor windlass.

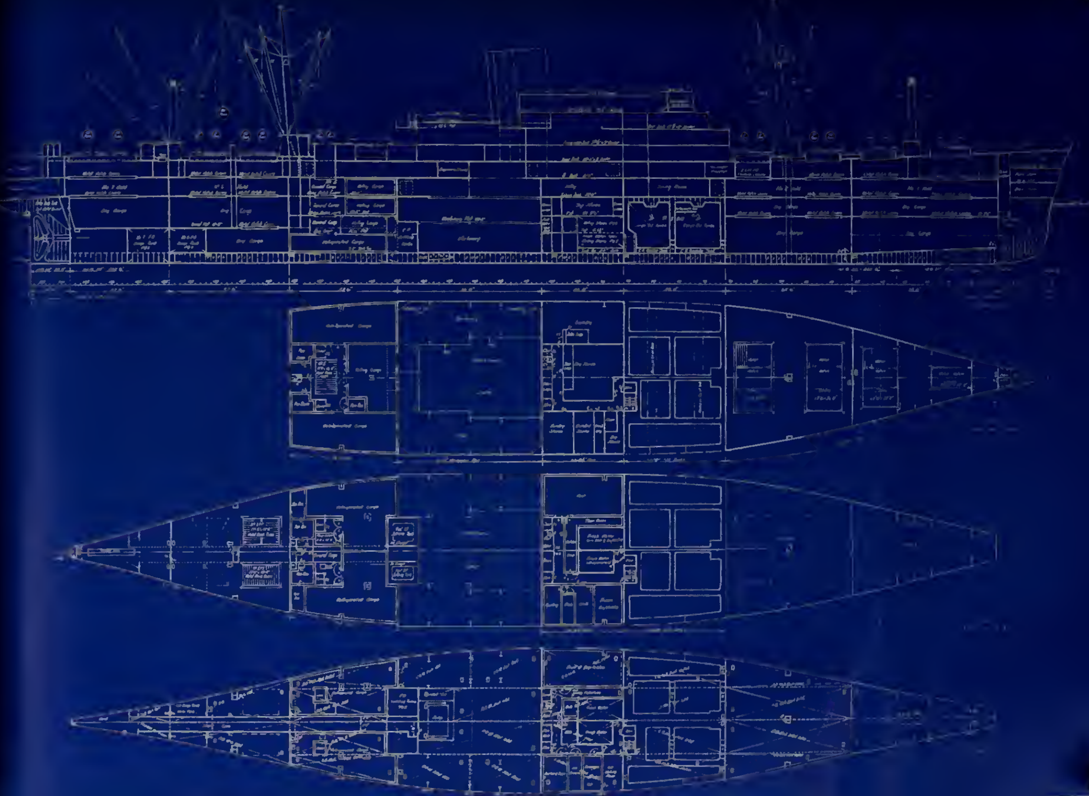
Hold No. 1

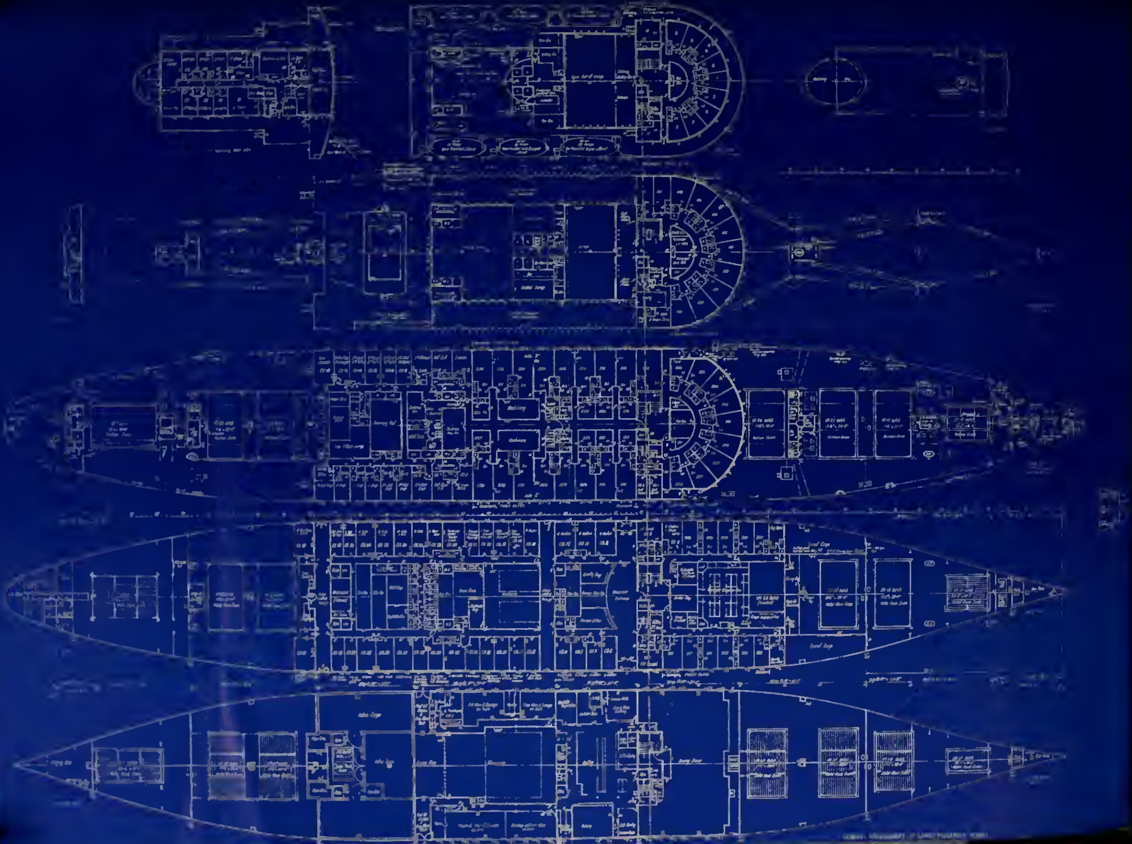
Next aft is Hold No. 1 which is 73 feet long fore and aft and is served by two hatches through each of four decks: the upper or weather deck, A deck, saloon deck, and a flat. The weather deck hatches are fitted with lift-off pontoon covers and on all the other decks the covers are metal hatchboards. The forward hatch of this hold is 16 feet thwartships and 20′3″ fore and aft. The after hatch is 32 feet thwartships and 17′6″ fore and aft.

Heavy king posts are located between these hatches with a small deck house between the posts for cargo air conditioning equipment. Each of these posts carries a 10-ton 55-foot boom on its after side and a 5-ton 55-foot boom on its forward side. The reason given for this unusual arrangement of hatches is that a much greater space on the decks can be reached spotting cargo loads off the hook than with the conventional single hatch. All the usual Maritime Commission standard equipment for cargo holds is fitted, such as connections for smoke detection tubing; connections for CO_2 fire extinguishing; ventilating ducts and outlets for cargo conditioning air; access ladders; and cargo battens. The vertical type of batten fitted between frames offers better protection to the cargo and increases the cubic capacity of a hold about 1 per cent.

Hold No. 2

Hold No. 2 is 62 feet 6 inches fore and aft and is arranged and equipped similarly to No. 1 from the A deck level down, except that both hatches for this hold are 32 feet athwartship and 17 feet 6 inches fore and aft. On the A deck level there are large compartments port and starboard for special cargo, a strongroom, and





a room for cargo air conditioning machinery. Between the hatches on the upper deck is a heavy steel mast serving as a king post and set on the centerline of the ship. Surrounding this mast is a T-shaped house enclosing lockers for deck gear, companionway to saloon deck and a room for cargo air conditioning. This house supports pads for the lower ends of four cargo booms, two 10-ton 60 feet 5 inches long, and two 5-ton 52 feet 6 inches long. A four foot wide watertight door through the after bulkhead of the hatch trunk gives access directly into a large baggage room fitted with ample racks and shelves to make baggage accessible to the passengers, an idea that will undoubtedly find great favor with passengers on the long Round-the-World trip with its wide variations in climate.

Hold No. 3

Hold No. 3 is a cargo hold only below the saloon deck level. From the tank tops to the saloon deck level it is filled with cargo oil tanks which are loaded through side ports, and a 5 feet by 7 feet hatch in the saloon deck. The six cargo oil tanks will accommodate approximately 1200 tons of oil. They are so designed that the interiors are entirely free of stiffeners and all corners are rounded. Just aft of this passage is the passengers' dining room, roughly 44 feet fore and aft and 70 feet athwartships with an inset 12 feet by 35 feet taken for stairways, elevator and lockers. On A deck level this vertical division includes: seven passenger rooms; chief purser, and chief steward's room, a room for 2 stewardesses and 1 child's nurse; the barber shop, automatic telephone exchange; music broadcast room; the passenger elevator; main staircase; pantry and various lockers. No. 3 hold is 50 feet fore and aft.

Hold No. 4—Main Galley

The main galley which prepares meals for the entire complement of passengers and crew is all electric, and is directly aft of the main dining room on the saloon deck and directly over hold No. 4 which is completely devoted to dry and refrigerated galley stores.

Stores are loaded through side ports and athwartship passage on A deck and brought down to the various levels by vertical conveyor and elevator. They are all very conveniently arranged both for ease of stowage in loading and accessibility from the galley.

The system of doors into the dining room is arranged for entrance from the galley only on the starboard side, and exit from the dining room only on the port side. Above the galley on A deck are the passenger entrance lobby, purser's office, purser's workroom, novelty shop and some crew accommodation.

Machinery Space

It is noteworthy that the modern plant for fueling the passengers and crew of this ship occupies approximately the same proportion of the length of the hull that formerly would have been occupied by the vessel's steam propulsion plant in the days of Scotch boilers and "up and down" engines. The modern high pressure water tube boilers and high speed reduction gear turbines of this ship are all enclosed with ample room for accessibility in a space less than one third that occupied by the crew and passenger fueling plant mentioned above. In other words, it takes much less of the revenue cubic of a modern cargo and passenger liner to fuel 12,500 horses than it does to fuel 347 men and women. Most of the fuel for the horses is carried in the non-revenue double-bottom tanks whereas the fuel for passengers and crew occupies practically the whole of one hold.

Afterholds

On A deck over the after end of Hold No. 5 there is a thwartship passage with side ports and a pair of vertical conveyors serving the A deck level down. A 10 feet by 16 feet hatch trunked from promenade deck to A deck also serves this space. In all the handling of cargo through side ports overhead gear will be used.

Holds No. 6 and 7 have practically the same arrangement as No. 1 and 2 forward, except that in addition to the regular 5 and 10 ton booms No. 6 has a 30 ton 70 feet boom fitted, and that No. 7 has only one hatch which is 32 feet 6 inches fore and aft and 20 feet thwartship.

The after peak at the saloon deck level houses the hydro-electric steering gear and on the A deck level takes care of the ship's brig, lamp, paint and chain lockers, engineers' and bos'n's stores and carpenter shop.

These arrangements of the principal watertight subdivisions show careful planning for convenience and economy in the functions of passenger ship operation. It will be noted in the foregoing description and in the inboard profile that all of the commissary and refrigerated stores are located directly below the main galley and all the dining rooms, both passenger and crew, are directly contiguous to the galley fore and aft, and on the same deck level. The tankage cargo is complete in another hold subdivision. All refrigerated cargo is completely and exclusively in its own watertight hold division. The baggage room is very conveniently located and efficiently served through one of the main cargo hatches.

Safety

This design is stable and seaworthy in every respect and is a three compartment job. That is, three compartments must be flooded to sink the ship. Every precaution is considered in the equipment for detection of and extinguishing fire. Life preservers or life saving suits are provided for everyone aboard. Six life boats, one of them a powerful motorboat equipped to tow all the others are hung in gravity davits served by electric boat winches. The combined capacity of these boats will accommodate all persons aboard. Special hawse pipes will be fitted bow and stern for mooring to buoys. On the bridge all the most modern navigation equipment will be fitted including gyro compass, radio direction finder, radar, and loran.

Propulsion Machinery

This vessel is designed to be driven by a single screw and has a "contra-guide" form rudder post to transform some of the angular velocity of the water in the propellor stream into forward-motion energy for the hull. The propeller shaft is turned through double reduction gearing by a cross compound steam turbine designed to deliver 12,500 shp at 92 rpm of the propeller shaft when

(Please turn to page 106)

THE MAINTENANCE AND REPAIR OF ARMY VESSELS

At The San Francisco Port of Embarkation

By P. H. THEARLE,
Superintending Marine Engineer

Philip H. Thearle, San Francisco Port of Embarkation.

IN THE OPERATION OF ANY SHIPPING BUSINESS the maintenance and repair of the equipment necessary to move the freight and passengers is a function of the operation, which contributes very greatly to the successful performance of the business. In a steamship line the maintenance and repair organization is planned to accomplish the economical maintenance of the fleet within the time limits prescribed by cargo discharge and loading with the ultimate end in view that the fleet will be maintained in a satisfactory operating condition with a minimum expenditure of funds.

The repair work accomplished not only includes normal repairs to machinery, hull and appurtenances but also requires that vessels be maintained in classification society class and in condition to obtain all certificates of safety required by the Coast Guard and Public Health Service, as well as annual inspection and periodical drydocking.

In the Army's transport service, which is at present this country's largest steamship business, the entire Army owned-and-operated fleet is divided between several Ports of Embarkation, and, depending on the requirements of the service, the vessels are home ported at these several ports. The San Francisco Port of Embarkation is at present the home port for the following vessels of the Army owned-and-operated fleet:

6—P-2 turbo-electric transports
2—P-2 geared turbine transports
10—C-4 geared turbine transports
3—C-1 geared turbine Hospital ships
4—VC-2 geared turbine freight ships
2—EC-2 reciprocating engine freight ships

making a total of 27 vessels which must be maintained by this Port.

All repair work is accomplished under the authority of Transportation Corps pamphlet Number 34 which divides the work into two groups, normal repair and major repair. Normal repair consists of those items of routine work up to a total cost of not more than $60 per foot of length. Major repair is considered to be those items which are modifications or improvements in the basic vessel and any costs above $60 per foot of length. The Ports are authorized to proceed with all normal repair without prior approval from the Office of The Chief of Transportation in Washington, D. C., but must obtain prior approval before proceeding with major repair items.

Under the Port Commander is an operational section known as the Water Division. Under the Superintendent of the Water Division is the Superintending Marine Engineer, who is responsible for the Engineering Branch and the Marine Repair Shop Branch.

The Engineering Branch is responsible for all repair and maintenance work on Army owned-and-operated vessels, and is composed of three major sections—planning, inspection, and administrative. The employees of the Planning and Inspection Sections are all people with a broad experience in the marine industry, many of them licensed engineers, together with several who are specialists in certain phases of marine work.

Between January 1st and June 30th of this year 73 vessels have arrived in the San Francisco Port of Embarkation and records show that an average of 10 vessels have been in port at one time undergoing repairs.

The largest part of Army vessel repairs is accomplished by commercial repair contractors who hold the Army's Master Lump Sum Repair Contract, and the award of each job is based on competitive bidding.

The Army also maintains a Marine Repair Shop whose primary function is to accomplish the many small items which may have developed or been overlooked in the normal repair process, but it is also maintained in sufficient strength to accomplish the normal voyage repairs on one vessel at a time.

The funds which pay for this work are allocated to the Port's Fiscal Officer by the War Department from Congressional Appropriations. The amounts required for each fiscal year are based on budgets prepared at each Port of Embarkation. .

Since the Engineering Branch is required to obtain approval on the expenditures of all funds, cost accounting is carried on within the Branch by a representative of the Fiscal Officer, who is constantly in touch with the progress of each project and advises the job planners as to the status of their funds.

The following routine procedure has been established for handling each vessel:

1. Upon arrival of an Army owned vessel, the following routine procedure will be adopted in accordance with TCP-34 to accomplish the voyage repair work required on that vessel:

(a) The Chief Planner will assign a planning team to cover this vessel, and will designate one planner to act as leader. It will be the leader's responsibility to carry this job through to its final completion.

(b) The Chief Inspector will assign an inspection team to cover this vessel and will designate one inspector to act as leader.

(c) Both planning and inspection teams will board the vessel as soon after arrival as possible. The Chief Planner, the leading planner, or other designated party will pick up copies of the voyage repair lists and distribute same to members of both teams. The Chief Planner, or the leading planner, if so designated, will be in charge of all functions of the preliminary inspection and arrival conference. He will assign members of both planning and inspection teams to cover various parts of the repair lists and the vessel. They will survey all items of work requested and in addition develop as many additional items not covered by ship repair list which might be considered desirable to discuss at the arrival conference, in order to avoid the possibility of having to cover same by means of field orders after the basic specifications have been prepared.

a. The planners and inspectors will be thoroughly familiar with the contents of TCP-34.

b. It is the intent of the above instructions to provide an orderly and thorough survey with no overlapping or covering items more than once.

(d) The Chief Planner or the leading planner if so designated will preside at the arrival conference and will lead a discussion of the various items of repair requested. He will endeavor to eliminate as many items as is considered possible after discussion with the Chief Engineer and will attempt to keep the repair work authorized to a minimum commensurate with safe and economical operation of the vessel. All additional items of work developed by the preliminary survey will be discussed, and those which are deemed essential shall be included in the basic specifications, with the result of a very minimum of extra work being found necessary to be accomplished on change orders during the progress of the repairs.

(e) Under the direction of the Chief Planner, planners will prepare written specifications covering all items of work which have been determined as necessary to be accomplished by the arrival conference.

(f) A Job Order Request will be filled out by the Chief Planner on TC Form 1800 requesting the Contracting Officer to call for bids on subject vessel. A copy will be sent to Vessel Movement for Control Symbol TCSFP-OW-4R.

a. At this time the date and time for opening of bids will be determined after consideration has been given to the time required to complete the work and the prospective sailing date, with a view toward allowing as much time as possible to the bidders for preparation of their cost estimates.

b. A Purchase Request will be filled out on Form 14-115 and sent to the Fiscal Officer giving the estimated amount of funds to be obligated on F.Y.P.463.

c. An Obligation Report will be filled out on Form 55-13 and mailed to OCT, Attention: Water Transport Service, Maintenance and Repair Branch.

d. The cost and expenditure group will set up and maintain a running account of funds obligated on the vessel. They will inform the Superintending Marine Engineer and planner when the funds on the vessel are within $3,000 of the amount approved by TCP-34 or teletype from OCT.

e. Service Orders will be prepared by the group under direction of the planner when the item to be repaired can be sent direct to the manufacturer's representative.

f. In the preparation of specifications the greatest care shall be exercised in wording the items to avoid misunderstanding and misinterpretation on the part of the cost estimator. Each item should be considered for completeness of information and clarity. When an item requires the furnishing of material that cannot be obtained in sufficient time to permit completion within the specified time, this item should not be included in the specifications. The vessel should be requested to requisition the required material or parts, and when received, the item should be written in a specification on the next arrival. The assigned planner will contact TC Supply for procurement of critical materials from Government stock.

(f) At the time specifications are issued, notice will be given to bidders that inspection of the work will be conducted at a specified time, and the Chief Inspector will designate the necessary number of inspectors from the team assigned to this vessel to conduct the bidders over the vessel and show them the items. The inspectors will avoid attempts to clarify the wording of items, or in any way instructing the bidders as to the detail of work required. When such questions arise, the bidders should contact the planner for further instructions.

2. Upon award of a contract for repairs, the previously assigned inspected team (par. 1 (b) will assume responsibility for the accomplishment of all work in accordance with the specifications. The leading inspector will be the responsible head of the team, will assign inspectors to cover the various parts of the work, and will be the Water Division representative to carry on all discussions with the contractor regarding progress of the work and field orders.

3. When an additional work item is developed by an inspector, after investigation, he will take it up with the assigned planner to see if funds are available. Then the inspector prepares a field order, giving a brief description of the work. He will request an estimated price from the contractor, and on receipt of same will present the field order with the price to the leading planner for approval.

4. In the event that the estimated price appears too high to the leading inspector he shall contact the contractor and endeavor to justify or adjust the price quoted prior to submitting same to the assigned planner. The planner will issue an authorization number, and record same in authorization book. The field order with authorization number, is written authorization to proceed with additional work not called for in basic specifications. Four copies will be made—one each for Contractor, In-

(Please turn to page 90)

The flagship of the Matson Lines, the Lurline.

Lurline WILL SOON BE READY

As PART OF ONE THE MOST extensive merchant ship construction programs ever undertaken by a single ship-operating company in the history of the Merchant Marine, the Matson liner *Lurline* will soon be ready for final drydocking and outfitting. She will probably be ready to sail in February or early March. United Engineering Co., a Matson subsidiary, is completing the work on the *Lurline,* which, with the *Matsonia, Mariposa* and *Monterey,* form Matson's luxury passenger fleet. Of these, only the *Matsonia* is in service. Matson's program requires the reconversion of passenger ships, and also 23 freighters. The latter are under way in a number of yards around the country, with the first of the C-3's, the *Hawaiian Packer,* just put in service.

When finished, the *Lurline* will accommodate 726 passengers, 488 in first class and 238 in cabin class. The prewar capacity was 701.

The power plant on the *Lurline* consists of 12 Babcock and Wilcox, inter-deck superheater, standard marine type, water tube boilers, arranged in two boiler rooms and supplying steam at 360 psi and 650°F. throttle, to two sets of triple expansion Bethlehem-Parsons turbines, each set driving its line shafting through Falk single reduction gearing, three pinions driving one large gear. Speed of propeller is normally 125 rpm and that of the turbine approximately 1600 rpm. Under normal conditions this plant drives the hull at 20.5 knots speed. On the original trials of the *Lurline* with everything wide open, the turbines generated 30,000 shp and drove the hull at a maximum speed of 22.5 knots. Fuel consumption figured at 0.625 pounds shp.

Use of Aluminum

Interesting in this conversion is the large use of aluminum in the superstructure and in partitions for passenger and crew accommodations. On the sun deck, the wooden houses for crews' quarters were entirely removed and a steel frame house with aluminum sheathing erected. This house extends from frame 119 to 151 and in addition to crews' quarters, contains a room for air conditioning equipment and the pent houses for the elevators. On top of this house at its forward end is a compass platform with standard magnetic compass and gyro-repeater.

In all passenger, officer, and crew accommodation spaces the hulls were stripped to the bare steel and all quarters re-arranged and rebuilt in accordance with the new subchapter "M" of U. S. Coast Guard regulations which now govern in the construction arrangement, and equipment of passenger and crew quarters and which is especially addressed to fireproofing and fire resistance, the confining of fire, fire escape and fire extinguishing. These three vessels when finished, will be the first passenger liners to fully comply with the new regulations, and since these regulations are well in advance of those governing in other countries, it can be truthfully said that these Matson liners are the safest afloat so far as fire is concerned.

All partitions in the new arrangement of quarters are of Johns-Manville Marinite faced with aluminum. The joiner work in these quarters was all done by Hopeman Bros. of New York. On the boat deck, the afterhouse was extended forward port and starboard abreast of the after stack casing, from frame 80 to frame 94. This addition is steel frame with aluminum sheathing.

B Deck Changes

The most important structural changes in the hull are on the "B" deck level. Here the "B" deck promenade is eliminated and the house extended to the ship's side. Hull frames are extended to "A" deck and "A" deck beams connected to frames, girders strengthened and new side plating fitted. The space thus enclosed is arranged for and fitted with new passenger quarters. "B" deck is extended forward over the well deck, in a completely new structure, with A.B.S. regulation frames, deck beams, brackets, stanchions, deck plating, and shell plating. This large additional enclosed space is devoted to crews' quarters and to air conditioning machinery rooms.

Principle Characteristics

Length Overall	632′0″
Length Waterline	628′0″
Length B. P.	605′0″
Beam Molded	79′0″
Depth Molded C. Deck	52′9″
Draft Molded	28′0″
Displacement on Draft	26000 tons
Gross Measurement	18017 tons
Net Measurement	10580 tons
Normal Shaft hp	22000
Sea Service Speed	20.5 knots

Hull Repairs

The stacks were modified by removal of the umbrella tops and the recessing of the whistle and whistle platform in the forward stack. All exterior damage to the hull was repaired and fashion plates port and starboard at the after ends of A, B, C, and D decks altered and renewed to conform to profile of the vessel. In this process, the entire exterior was sandblasted to the bare steel, and wherever plates were deteriorated or damaged they were renewed. In most of the service spaces of the ship all equipment was removed for overhaul or renewal and the decks and bulkheads were cleaned and scaled to the bare steel and repainted. Spaces so treated included passenger and crew hospital; surgery; laundry; print shop; all linen storage spaces; tailor shop; all storerooms and lockers; main galley and crews galley and bars and pantries.

In the galleys, all equipment was thoroughly overhauled and much of it renewed. All food handling and storage spaces were effectively rat proofed according to U. S. Public Health Service regulations. New deck covering and new waterways were installed in the main galley to conform with U. S. Public Health Service rules. Crews' mess rooms and pantries were relocated and re-equipped.

Electrical

New electrical equipment and new wiring systems were installed throughout the ship for such services as: ship service and passenger service telephones; stewards' call bell system and annunciators; emergency loud speaker system; general alarm bell system; public address system; fire detecting system; fire door control system; water-tight door control and signal system, and telemotor wiring.

The fire detecting and fire extinguishing systems originally furnished by Walter Kidde & Company, Inc., have been altered to suit the re-arrangement of the vessels.

The Rich Smoke Detecting System has been altered to provide fire detection for the cargo spaces.

The Lux (Kidde) System has been extended to cover the domestic refrigerator boxes, so that now all the spaces on the vessel occupied by cargo and machinery are protected with carbon dioxide fire extinguishing.

Refrigeration

All of the cargo and ships' stores refrigeration boxes were torn out and entirely rebuilt providing a total refrigerated net cargo capacity of 61,200 cubic feet. Completely new Carrier Freon refrigeration machinery was installed to take care of the cargo and ship stores and also to handle the large air conditioning load.

Fresh Water

A very interesting new installation on these vessels is the large evaporating capacity for supplying fresh water. Two new low pressure evaporators each with a

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LORIMER DIESEL GENERATING SET

75 kw direct current emergency diesel generating set using a Lorimer F-4-S engine with a 4½" bore, 9½" stroke, and developing 115 hp at 720 revolutions. The unit is capable of a 25 per cent overload for a 2 hour period.

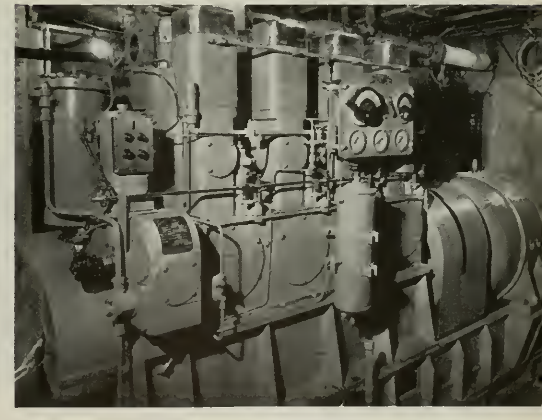


Fig. 1

NEW PLASTIC ANTI-FOULING PAINTS

By HAROLD L. ALDRICH

During the past two years several feature articles on hot or cold plastic paints have been published in Pacific Marine Review. This article by Mr. Aldrich offers some further food for thought on the subject.

The editor will welcome opinions from ship operators who have had experience with these paints. Such opinions will be published only after permission has been obtained.

Definition and History

SOMETHING NEW HAS BEEN ADDED to the paint business during the War—a way of getting solid paint (hot plastic) to stick to the hull of a ship. This hot plastic has it all over any other anti-fouling system for killing barnacles. However, it is expensive, tricky to apply, and difficult to remove. There is nothing revolutionary in solid paint itself, for one was tested back the 19th Century as shown; the trick is in applying it so it will stick.

Hot plastic paint is a solid at ordinary temperatures in which pigment is mechanically dispersed. It is applied in a molten condition without the aid of a solvent, and dries to a solid by cooling—not requiring oxidation, or polymerization. The best known application of hot plastic paint is in the protection of Navy ship bottoms.

The history of hot plastic paint goes back to the nineteenth century when in 1899 an Italian hot plastic paint for brushing, with trade name "Moravia," was tested at the Norfolk Navy Yard and found to have unusual durability, so in 1901 it was brushed on the U. S. S. *Wagneta,* and the paint required only retouching at the next dry docking six months later. The Chemical Warfare Service of the Army at the Edgewater Arsenal developed a hot plastic in 1924 which was manufactured and tested at the Norfolk Navy Yard and found to be unsatisfactory because of inadequate adhesion. In 1932, at the Mare Island Navy Yard, Moravia hot plastic was applied by brush on the U.S.S. *Milwaukee,* and some of this paint was still in good condition thirty months later. In 1938, the Paint Laboratory at Mare Island Navy Yard announced the development of the first sprayable hot plastic. Upon the advent of hostilities in the Pacific, it was realized that some ships might be required to remain in extreme fouling water for the duration without an opportunity for repainting, and it would, therefore, be necessary for the bottom paints to protect the hull for eighteen months or more. Generally speaking, the water impermeability of practical bottom paints is proportional to the film thickness applied, and since no practical method, other than hot plastic, of applying extremely thick films was known, it was considered the best possibility. A few service tests indicated that hot plastic bottom paint would last eighteen months, which was considerably longer than the durability of orthodox solvent paints, therefore, in 1943, it was decided to standardize on hot plastic for steel bottoms. Research, development and production were carried on simultaneously,

Fig. 2

and by 1945 over a thousand formulations were under test. For this paper, the classification "hot plastic coatings" will be confined to those which do not require the use of volatile solvents. The term "plastic" when used in connection with hot plastic paint is a misnomer, but since the term is in general use it will be continued in this article.

Getting the Right Start

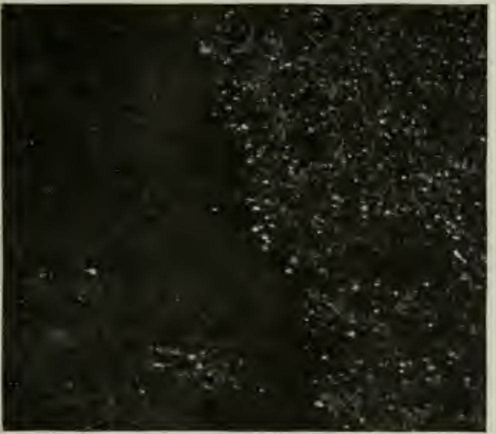
The application of hot plastic is considerably more exacting than that of orthodox paints. Ships for repainting should be prepared by sand-blasting to bright steel, and by spraying with a 2 to 5 per cent phosphoric acid solution, and by priming with two or three coats of anticorrosive. The hot plastic should be sprayed to a thickness of approximately 30 mils, using a double pass of the gun, which amounts to over 10 times the film thickness of orthodox bottom paints.

The solid paint is melted in large heating kettles, and transferred to electrically heated pressure kettles, which generally operate at 90 lbs. per square inch air pressure and 300° F. With this equipment, the hot plastic can be sprayed to any desired thickness by building up the film as each coat cools. The entire bottom of a destroyer can be coated with hot plastic by an experienced crew in less than two hours.

The development work on equipment for application has lagged far behind the development of paint formulation, mainly because the market for equipment is limited and it does not warrant commercial interest. The present procedure requires several operations in addition to the application of the paint in the dry dock, and the labor of make-ready and clean up is far more expensive and time consuming than the actual application. Some of the applications are listed below:

crane service for lowering drum of hot plastic, melting kettle, pressure kettles, etc., into dry dock;
chopping open the steel drum;
breaking up the solid hot plastic with axes;
loading melting kettle with hot plastic;
melting down and preheating to 300° F.;
transporting melted hot plastic in five-gallon pails to the pressure kettles;

Figure 3



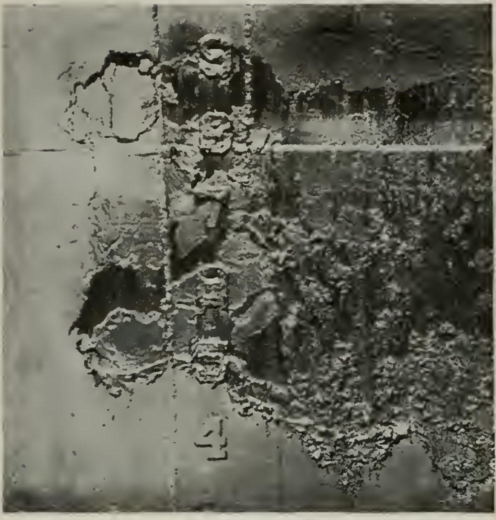


Figure 4

A large proportion of this expense could be eliminated by maintaining a supply of melted hot plastic at the top of the drydock which could be piped down to the pressure kettles, or directly to the spray gun. The packing of hot plastic in five or ten gallon wooden kegs would eliminate the expensive and wasteful operation of chopping up the hot plastic in the drydock.

The pressure kettle is a ten-gallon, single container, electrically heated tank which forces the molten paint through a heated hose to the spray gun. The operator is inactivated during the refilling operation. A two-compartment pressure kettle which could be loaded without interfering with the spray gun operator would not only speed up the painting operation, but considerably reduce the cost thereof.

Another application problem involves the hand gun, which, when used on the flats, produces a fan, one end of which generally travels two or three times as far as the other to reach the hull, as shown in figure 1. The paint traveling in the long end of the fan cools and hits the hull in a partially solidified condition, which will result in a porous film through which water can pass. This difficulty is responsible for the rusty condition of many flats painted with hot plastic. An extension gun which facilitates the elimination of porous spots is under development.

This discussion may seem trite, but when commercial use of the product is attempted, each one of these factors

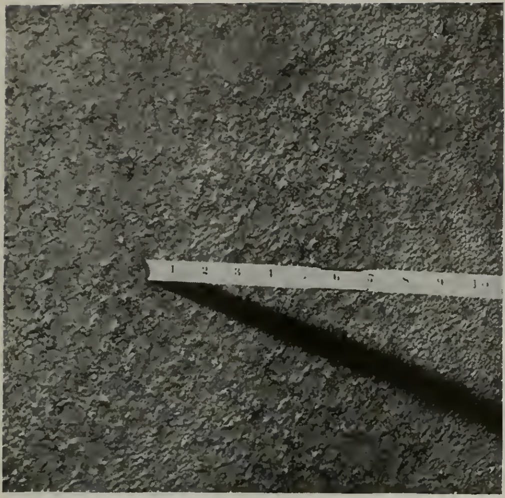


Figure 5

becomes a cost, tending to keep the expense of application so high that it is difficult to economically compete.

General Requirements

Many testing methods new to the paint industry have been uncovered during the development of hot plastic in an attempt to correct deficiencies in the original product. These are research tools which have elevated the work from the "witches brew" stage to somewhat of a scientific basis. Some of these are leaching rate of toxics and matrices, plastic flow resistance, electrical measurement of the initial time and area of corrosion, measurement of osmotic and endosmotic water pressure in films, and the use of randomized replicated methods of designing tests.

The testing of many different types of hot plastic has led to the following requirements: A viscosity of less than 1.5 poises when heated to the temperature of application—generally between 275° and 300° F. Figure 2 shows the concentration of paint in the edges of the fan caused by a paint of 2.8 poise viscosity, which has been found to be too high a viscosity to give satisfactory fan at normal spraying pressures.

If copper is the anti-fouling ingredient, the leaching rate of the matrix and that of the copper pigment should be balanced to permit copper to leach from the film at a rate of, at least, 10 mg. per 1,000 sq. cm. per day when the film is immersed in salt water. Figure 3 compares the fouling of a paint with a leaching rate of 6 on the other side of the photo, and which has been exposed for six months.

The paint should not sag when the surface upon which it is applied is heated to 140° F. Figure 4 shows the sagging which took place on a newly painted hull when a paint of 125° F. sag point was exposed to solar radiation.

There should be no plastic flow when a film is tested on a 30″ diameter spinning cylinder, moving at a peripheral speed of 30 knots in water at 85° F. In figure 5 the paint gives the appearance of a sharp stipple job. It is actually the result of plastic flow over an original smooth bottom after the ship had made a run through tropical waters at over 30 knots.

Early Day Troubles

During the early development, stories are told of the hot plastic flying off into the water at the first full power run after painting. Detailed docking reports on the condition of all bottoms are now maintained in the Bureau of Ships, and eighteen months is not unusual for the durability of hot plastic, which was not true of orthodox paints. In general, the anti-fouling properties outlive the corrosion resistance of hot plastic, and when corrosion begins, it takes the form of small hair cracks. The degree of success obtained with hot plastic has been proportional to the quality of the surface preparation, which was well demonstrated by a test in which the one side of a ship was sand blasted and the other, wire-brushed. The ship was then primed with anti-corrosive and quartered, comparing hot plastic with the cold plastic type. After eight months in salt water, the hot plastic, compared with cold plastic, gave decidedly inferior corrosion resistance over improperly prepared steel, and decidedly superior corrosion resistance over the sand blasted surface. The thick impervious layer of hot plastic which prevents moisture from penetrating also inhibits the escape of moisture trapped under the film during painting, and this is the basic reason why it is not durable over a poorly prepared surface. When trapped moisture or the products of corrosion break through a thin orthodox film, nothing more than a pin hole may result, but when this occurs to hot plastic a large area may be torn from the hull.

The use of hot plastic over a bottom that has never been sand-blasted and has a base of mill scale and rust, as most ships do, would be an economic waste and a discredit to the paint.

Hot plastic has demonstrated protection against corrosion and fouling on specially prepared panels for periods of over four years; however, on ships in action good protection has been attained in most cases for eighteen months which difference indicates that if more suitable ways of application were available, perhaps the service on panels would be approached on ships.

It is difficult to compare the costs of hot plastic and orthodox painting, because the two methods require different types of application and lengths of time in dry dock. However, making the assumptions enumerated below, it is possible to make a cost comparison based on an 18,000 ton passenger liner painted in the San Francisco Bay area and reported at a meeting of the Society of Naval Architects of Northern California in 1946. The charges, including docking, cleaning and painting were as follows:

Cost of commercial bottom paint job	$ 4,409.50
Cost of hot plastic system	17,778.15

The high cost of the hot plastic is mitigated by the extra protection and fewer repaintings needed.

There are a number of expenses connected with the use of hot plastic not accounted for in the above comparison. After a few years, and after a few recoatings, the hot plastic surface gets rough as a result of peeling under drains, cracking around rust spots, and plastic flow on the outside of compartments the inside of which have been steamed out. When a scaling job becomes necessary, the only practical procedure is sandblasting and this is an expensive job. The "ship's time" has not been included in the above estimate and considering the one day that the ship will be tied up for the commercial bottom painting, this cost should be increased by $4,000, whereas considering the five days required for the hot plastic job $20,000 should be added to this cost.

Future Changes Seen

The hot plastic system of the future should be considerably different from that in use today, and the present procedure will probably be considered in retrospect as a stop-gap which filled a special wartime need. It was estimated that an anti-fouling paint was needed which would keep warships free of barnacles for a period of eighteen months. Fouling resistance was naturally considered of paramount importance, as compared with corrosion. The problem of long term fouling resistance has been solved by the use of hot plastic and not only has this been demonstrated on ships in service for eighteen months, but by panels over a four year's exposure period; but the system adopted creates a condition conducive to pitting of the steel as the film ages.

The present procedure uses an anti-corrosive dried film thickness of two to three mils, and an anti-fouling film thickness of thirty mils; whereas, theoretically, only one-sixth of this anti-fouling paint film would be necessary to leach copper enough for eighteen months' fouling protection, as outlined below. The purpose of using the excessive film thickness of hot plastic is to build up a thick water barrier—thereby supplementing the activity of the anti-corrosive paint. Hot plastic which has been exposed for a year or two has a thin green skin colored by copper carbonate, but upon cutting through this skin into the paint it is found that most of it is the original red color of cuprous oxide, thereby indicating that only the skin has been effective as an anti-fouling medium.

The film thickness needed for fouling protection can be computed. Based on the theoretical assumption that a leaching rate of 10 mg. of copper per 1,000 sq. cm. per day is adequate, and that the paint has a copper content of 4.5# per gallon, then a film thickness of 4½ mils should supply adequate toxic for eighteen months. It is not logical to use a paint containing copper for a water barrier because it is conducive to galvanic corrosion, and is an economic waste of copper. The galvanic action becomes apparent after the hot plastic has been in service less than a year. Hair cracks are generally the first sign of breakdown, and as the iron goes into solution at these points in the exchange of ions between the copper and iron, a dark film is deposited around the cracks as shown in figure 6.

Cold Plastic

It is believed that "cold plastic Shipbottom antifouling paint" is more practical for commercial use than hot plastic. Cold plastic was developed with the intention of approaching as far as possible the durability of hot plastic by producing a compromise between the film thickness of hot plastic and orthodox paint. It is similar to orthodox solvent-containing paints, except that solids are higher—generally above 80 to 90 per cent by weight with a resultant viscosity of over 100 Krebs units. A thixotropic body is required to eliminate sagging and running when it is applied in a heavy coat of 6 mils. There is a tendency and (as experience has shown) an irrepressible urge for painters to thin cold plastic to a viscosity of approximately 75 Krebs units, with the result than a thin film is applied, the durability of which

(Please turn to page 100)

Figure 6

THE DOWN TREND IN SHIPBUILDING

Frazer A. Bailey, president, National Federation of American Shipping, whose organization aided in the preparation of this feature.

THERE IS A GROWING CONSCIOUSNESS of the importance of the merchant marine on the part of certain important segments of the American public. Impressive among such groups is the American Legion which devoted important time to this subject at its recent convention, and has published a splendid booklet for general distribution. It is called a "Handbook for the American Legion on what We can do about America's Life Line," and is actually 36 pages of inspirational material for the shipping industry. It should have a far-reaching effect on America's thinking. The Legion has been advocating a strong merchant marine ever since its 1923 convention.

The Legion's interest is, of course, in national defense and it has stated: "The American Legion has profited by the experiences of two great wars, we want no more of 'rush construction' to meet urgent demands; we want the American flag to fly at the masthead of the world's largest and finest merchant ships; we demand a fleet of merchant ships, ready to be used for commerce, and in time of national emergency to be an auxiliary to our Navy. . . . Nothing short of that is safe, nothing less is sensible."

The National Federation of American Shipping and the magazine "World Reports" have collaborated in the preparation of the "Worldgraph" shown on the opposite page to sort of dramatize the shift in shipbuilding, and it is with the special permission of the publishers that it and its accompanying text are printed here. The text:

"While other nations are building up their shipbuilding industries, shipyards in the United States are lacking in new construction. More than half of all the merchant shipping now under construction is in British yards. Europe, despite its war-weakened economy, accounts for 9 out of every 10 ships now being built throughout the world.

"The shift in shipbuilding shown in the 'Worldgraph' herewith reflects the longer-range prospect for American shipping. Today there is excess tonnage in certain categories under the American flag, but it is becoming obsolete rapidly.

"United States shipyards provided one of the most dramatic chapters in the war effort. Peak production was reached in 1943, when 12½ million tons of ships were built. In that year, nearly one and a half million workers produced 1661 vessels. Then the national need was for ships at any price. Under peacetime conditions, other nations can build ships far more cheaply than United States builders, who must pay more for both materials and labor.

"The chart shows construction in the six leading shipbuilding countries in mid-1947, and a comparison with the situation one year earlier. By mid-1946, United States ships under construction had dropped below 600,000 tons, while the British total was nearly three times as great.

"By the middle of this year, as the chart shows, British construction had topped two million tons, and British yards were building 11 ships for every one built in the United States. Four other European nations had passed the United States.

"Most rapid strides were made by French shipbuilders. Starting from nothing after the years of German occupation and fighting, the French have pushed their total tonnage under construction up to a figure 25 per cent higher than the United States.

"New ships on U. S. ways now provide jobs for only 40,000—less than 3 per cent of the wartime peak. Most of the ships now building will be completed by the year's end, and before the end of 1948 shipbuilding in the United States may be down to almost nothing compared with the rest of the world."

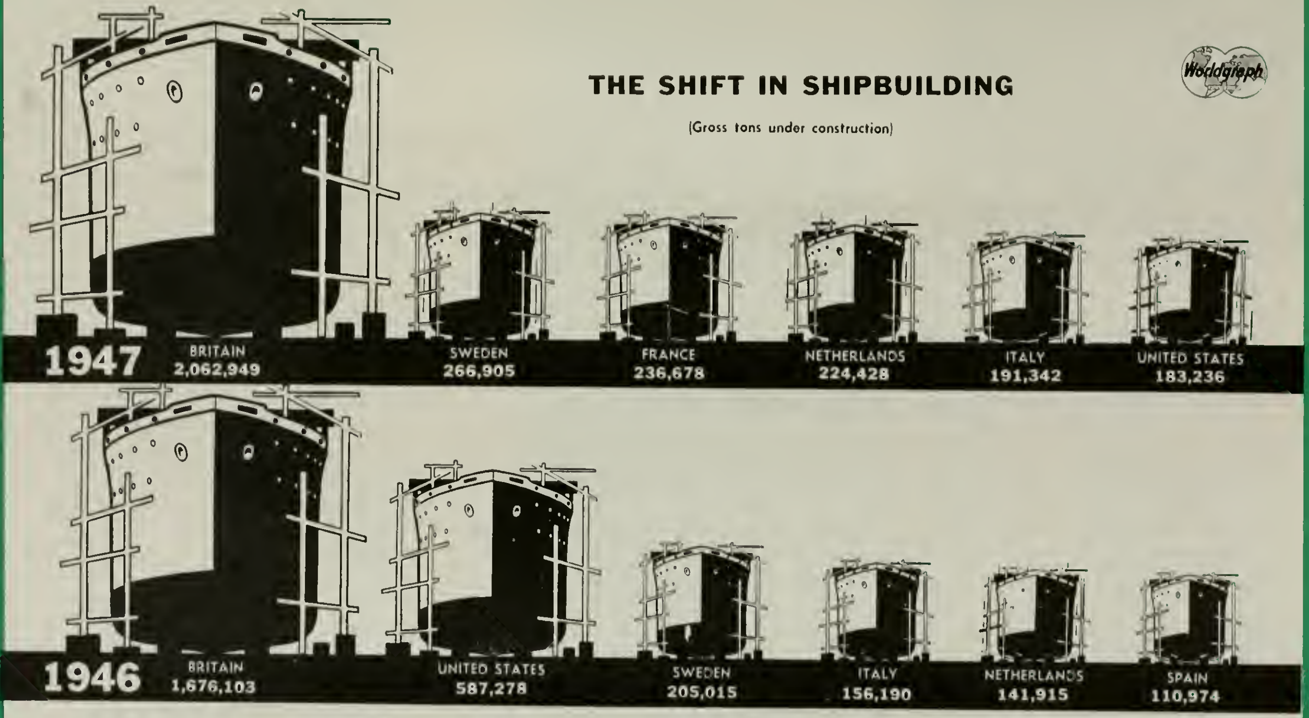
The best place to find a helping hand is at the end of your arm.

There is not much collective security in a flock of sheep on the way to the butcher.—*Winston Churchill.*

A fellow doesn't last long on what he has done. He's got to keep delivering as he goes on.—*Carl Hubbel.*

THE SHIFT IN SHIPBUILDING

(Gross tons under construction)



SHIPBUILDING AND SHIP REPAIR INDUSTRY

By W. MILLER LAUGHTON, District General Manager,

Bethlehem Steel Company's West Coast Yards

W. Miller Laughton

TODAY, AS SEEMS ALWAYS to be the case between wars, the basic problem of shipbuilding is survival. I believe it can safely be said that in peacetime the shipbuilding industry has not been a profitable one. Perhaps it might be well at this time to outline what I consider the shipbuilding industry to be.

The shipbuilding industry consists first of physical plant, ways, and shops, representing a very considerable investment. But more important than facilities is the investment the industry has in trained organization and skilled management. It has been demonstrated during the last war that emergency merchant vessels in large numbers can be produced by engineering firms who possess the energy and the engineering skills without a shipbuilding background. But to produce those vessels which the nation requires for its national security, namely, intricate combatant and passenger vessels, requires technological skills and engineering know-how that cannot be developed within a short period.

Perhaps next we had better investigate the reason for the question of survival of the shipbuilding industry.

This summer I heard ex-President Hoover say at an informal gathering that to his knowledge some 162 committees, commissions, bureaus or other agencies had been created by Executive action or act of Congress to investigate the Merchant Marine, and to determine the steps that should be taken to insure its continuance.

I believe that, without exception, the findings of all these groups was to the effect that a strong and adequate Merchant Marine was essential to our national security, and as a necessary corollary, the means of producing that strong and adequate Merchant Marine is also necessary to our national security. Perhaps the feeling of all of these groups is best set forth in the Preamble to the Ship Sales Act of 1946 which says in Section II of the Act:

> "It is necessary for the national security and development and maintenance of the domestic and the export and import foreign commerce of the United States that the United States have an efficient and adequate American-owned merchant marine
>
> (1) sufficient to carry its domestic water-borne commerce and a substantial part of its water-borne export and import foreign commerce and to provide shipping service on all routes essential for maintaining the flow of such domestic and foreign water-borne commerce at all times,
>
> (2) capable of serving as a naval and military auxiliary in times of war or national emergency;
>
> (3) owned and operated under the United States flag by citizens of the United States;
>
> (4) composed of the best-equipped, safest, and most suitable types of vessels constructed in the United States and manned with a trained and efficient citizen personnel; and
>
> (5) supplemented by efficient American-owned facilities for shipbuilding and ship repair, marine insurance, and other auxiliary services.
>
> It is hereby declared to be the policy of this Act to foster the development and encourage the maintenance of such a merchant marine."

From such language, no other conclusion can be drawn than that it is the policy of the United States to foster the shipbuilding industry. Why, then, do we find ourselves now in the position where, within the space of a year, unless positive action is taken by the Government, the industry will have no ships to build?

At the risk of being accused of over-simplification, let me say that in my opinion the basic reason for our dilemma is the wage paid to the American workman as contrasted with the equivalent wage paid to the workman in the other maritime nations of the world. Only last week I had as a visitor, the manager of a large Swedish shipyard, and in comparing equivalent wages paid our employees and his, I found that the basic hourly rate here was three times that in Sweden.

This ratio, I think, is probably good for most of our maritime competitive nations.

Recognizing that this greatly increased labor cost makes it impossible for private capital to purchase and operate vessels in competitive foreign trade, the Merchant Marine Act of 1936 provides for subsidies.

A subsidy is only a means of spreading among all taxpayers the cost differential which spells the difference between profit and loss to the ship operator.

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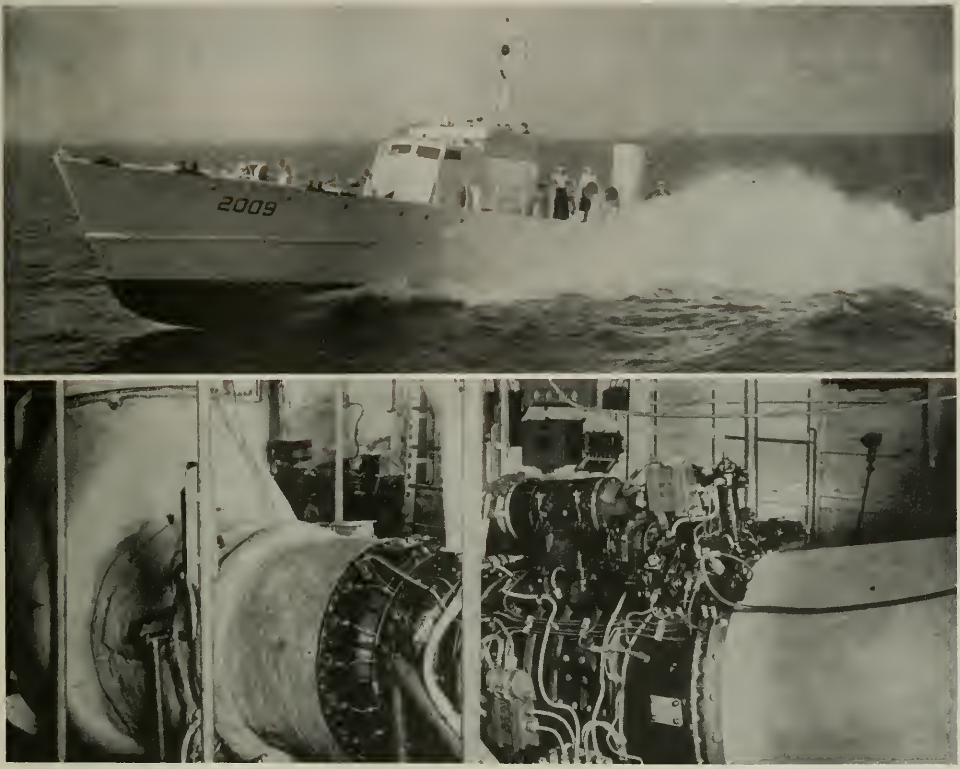
The above is taken from a talk delivered during a panel discussion on the Shipbuilding and Ship Repair Industry at the Merchant Marine Conference held at the 21st Annual Convention of the Propeller Club of the United States, October 16, in New York City.



Picture shows, top: British Navy M.T.B. 2009 makes successful trial in the English Channel. Bottom: Starboard side of gas turbine.
"New York Times" Photo

WORLD'S FIRST GAS TURBINE SHIP

THE FIRST SEA-GOING VESSEL to be propelled by a gas turbine engine has just been successfully tested in Britain. It is a triple-screw motor torpedo boat, 110 feet long, and powered by a Gatric turbine of 2,500 hp which drives the central shaft, taking the place of one of the three Packard 1250 bhp gasoline engines which formerly powered her.

This gas turbine has been developed for the British Admiralty by the Metropolitan Vickers Electrical Company of Manchester, and has been installed in M.T.B. 2009 in the Southampton yards of Camper Nicholson's. The turbine comprises an axial flow compressor, which supplies air under pressure to the combustion chamber. There it combines with burning diesel fuel to produce hot gases. These in turn are expanded through a 2-stage turbine, which drives the compressor, and finally through a 4-stage turbine which is coupled to the propeller shaft through gears.

The world's leading engineering nations have been interested for a number of years in the development and marine application of the gas turbine, an engine using oil fuel but in which the motion is entirely rotary.

Naval engineers responsible for the Royal Navy trials with M.T.B. 2009 emphasize that, although 34 knots compared with a previous 30 knots are obtained, no attempt is being made to secure phenomenal speeds, since

(Please turn to page 100)

- - With The

Marshall T. J. Garlinger, assistant superintending engineer, Fort Mason, San Francisco.

Port Engineer of the Month

San Francisco

Marshall Garlinger

It takes a big man to handle the job of Assistant Superintending Engineer at the Army's San Francisco Port of Embarkation and Marshall Thomas Joseph Garlinger is 5′ 18½″ tall—a fact that has proved useful when ceiling lights need fixing at club meetings and such.

Even back in 1917, when Marshall took the Bachelor of Science degree, and in 1920 the Mechanical Engineering degree, at Santa Clara University, and his post-graduate work in the Westinghouse steam turbine school, he was thinking away ahead, for his thesis was on the application of high speed turbines to marine propulsion.

He put in two years at the Bethlehem plant in San Francisco in 1918 and 1919, and then nine years as mechanical engineer in the Plant Department of Pacific Tel. & Tel. Company. From there he went on to the American Tel. & Tel. for four years where, among other worthwhile things, he developed the cable-laying plow still used in the telephone cable work across the country and estimates that this device has been used in construction work costing $110,000,000. Just within the last few days the San Francisco Chronicle carried a feature story on repairs to submarine telephone cable and showed a picture of the barge *Pacific,* a veteran of many years of cable repairing. The *Pacific* was designed and built by Marshall Garlinger and his present Chief at Fort Mason, Phil Thearle. The careers of Thearle and Garlinger have run along together through most of their professional lives.

After having more or less retired to private farming activities in the '30s, Marshall took on the engineer job at Fort Mason in January 1941, and is happy in his work. He is one of the charter members of the San Francisco Society of Port Engineers, and a member of its Board of Governors. No amount of talk about clubs and work and inventions, however, prevents a mention of Delorma and Marian, son and daughter of the big man. For one who almost but didn't quite get into Stanford, Marshall has a successful and enviable record.

An added touch: When the Bikini test pictures were shown in a San Francisco theater, an enlarged picture in the foyer listed Marshall's cousin, Master Sergeant John J. Garlinger, who was in charge of the ground crew.

Scene of the recent San Francisco Port Engineers' meeting. Among those present and seated around the table are: William E. Sizemore, Jake Edwards, Larry Rapp, W. B. (Butch) Hill, J. F. Neel, General Petroleum; Jim Riemers, Hugh Morrison, Ray Sample, John McArthur, M. T. J. Garlinger (presiding); W. D. Moore, K. C. Mann, both of Worthington; Jack Butler, Jim R. Anderson, USAT; Winslow Nott, Thos. Short Co.; R. D. Norden and H. E. Sargent of Worthington, Edsel and McKee of Pacific Fruit Express; T. Douglas MacMullen, Editor, Pacific Marine Review; Joe Gisler and Sam Hawkins.

Port Engineers -

At both the Los Angeles and San Francisco October meetings of the Society of Port Engineers, Refrigeration was the topic under discussion. The San Francisco meeting was addressed by W. D. Moore, of Worthington, and his talk is reported at length, beginning page 54. The Los Angeles meeting was addressed by Ralph E. Manns, whose subject was "Air Conditioning and Refrigeration on Ships."

Los Angeles Port Engineers

Left to right: Ralph E. Manns, of Ralph E. Manns Co., Wilmington and L. W. O'Bryan, manager of Pittsburg Sales Co. in Wilmington, at the October Port Engineers' meeting.

Bert Hale, vice president and general manager of Marine Solvents Service Co.

Port Engineer of the Month

Los Angeles - Long Beach Harbor

Bert Hale of Marine Solvents

Born and raised in California, Bert Hale started to sea at the tender age of 15, sailing with American-Hawaiian, Luckenback Steamship Company, the Morgan Line, and as third assistant on the *S.S. Momus.* He was with Pennsylvania Shipping Company for several years as assistant engineer; then with Standard Oil Company of California for several years as assistant engineer; and later he was with Pacific Tankers for three years as superintending engineer.

Bert Hale helped to develop the T-2 tankers. He started the Wilmington Engineering Service as manufactures representative and acted as marine surveyor.

Recently he joined forces with Albert O. Pegg and formed the Marine Solvents Service Corp., to offer to the marine trade an engineered chemical cleaning service, which includes land and floating equipment, designed for quick marine turnarounds for which the equipment was specially constructed at a cost of $100,000. He is now vice president and general manager of Marine Solvents, and is well moored ashore, after 19 years at sea, with a wife and three children. His hobby—ships and machinery.

Puget Sound Port Engineers

Left to right: Thomas F. Barnett, Loran Institute, Seattle Office, Sperry Gyroscope Company; H. S. Burtis, Seattle manager, Sperry; O. B. Whitaker, marine sales manager in New York for Sperry; Joe Sweetin, president, Society of Port Engineers; and A. C. Dahgliesh, sales manager, Seattle Office of Sperry.

CENTRIFUGAL REFRIGERATION SYSTEMS

By W. D. MOORE

IT IS THE PURPOSE OF THIS TALK to deal with the application of centrifugal compressors to refrigerating systems and to discuss the operating characteristics of such systems when applied to air conditioning and refrigerating installations.

Centrifugal compressors are inherently high volume, low head machines, and, therefore, are not applicable to all refrigeration installations. They are best suited for installations requiring large capacities at low compression ranges.

Centrifugal compressors employed in refrigerating systems are manufactured in sizes ranging from approximately 2000 cubic feet per minute gas capacity to approximately 20,000 cubic feet per minute. In refrigeration capacity for air conditioning applications they range in size from 75 tons to 1200 tons refrigerating effect.

At the present time the refrigerant most commonly employed for medium and high temperature application is FREON-11, others of the hologenated hydrocarbon group including FREON-113, FREON-114, and FREON-12 are also used in centrifugal compressors in refrigerating systems.

FREON-11 has a high specific volume, requires a low compression ratio for air conditioning installations, its theoretical cycle efficiency is high, its boiling point is high, and as it permits operation at relatively low pressures, it is an ideal refrigerant for high and medium temperature applications in systems employing centrifugal compressors.

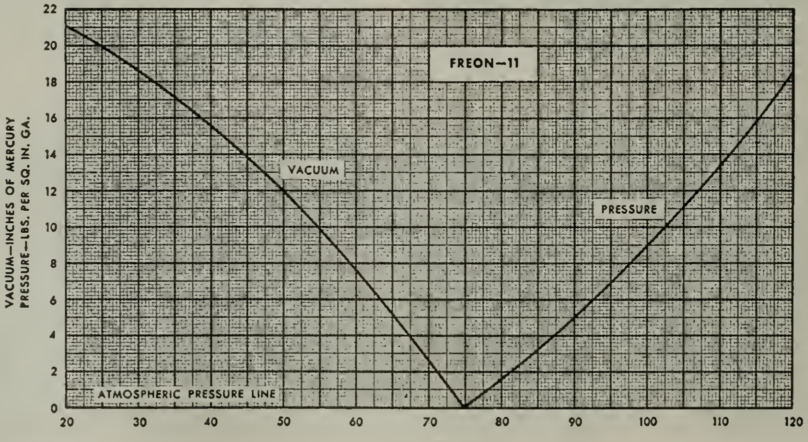
FREON-11 requires the evaporation of approximately 16 cubic feet of gas per ton as contrasted to FREON-12 which requires approximately three cubic feet per ton for average air conditioning conditions: operating pressure for FREON-11 is approximately 18″ Hg vacuum and 10 pounds per square inch discharge as compared to 32 pounds per square inch gage suction and 125 pounds per square inch gage discharge for FREON-12 systems.

At the present time the conventional arrangement is with the condenser mounted above the evaporator and the compressor parallel to the cooler and as close to the floor as practicable.

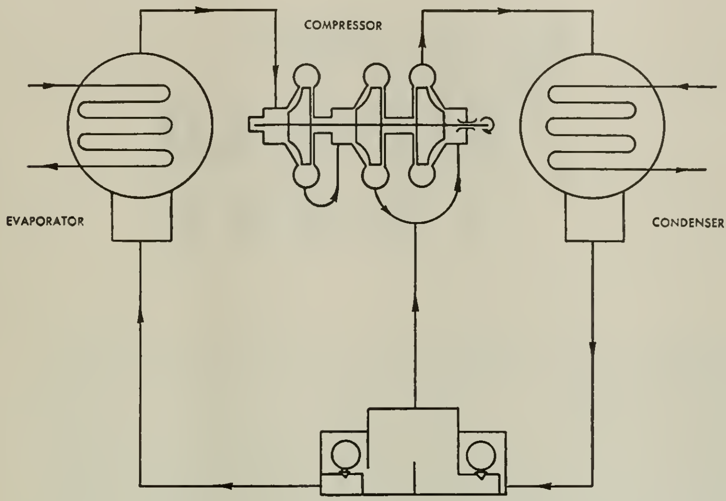
Comment on Installation

This arrangement of condenser above cooler has the advantage that it requires a minimum of floor space and that the liquid follows a natural path downward from the condenser through the float valves, the flash chamber, and into the evaporator. Because of the larger gas volumes handled by the compressor the inlet and discharge connections are as large and as short as possible. The compressor inlet bolts directly to the evaporator and the discharge connection bolts to an expansion joint which, in turn, is bolted to a flanged nozzle on the condenser.

There are two general types of centrifugal compressors used for refrigeration service, namely the diffuser type and the volute type: In either type a series of impellers is employed, each consisting of a number of vanes mounted between two discs, which perform the function of compressing the gas. The gas leaves the tip of the impeller at a high velocity and enters the housing where the velocity is transformed into pressure.



Mr. Moore is regional refrigeration manager of Worthington Pump and Machinery Company, and this paper is adapted from a talk he gave before the October meeting of the San Francisco Society of Port Engineers.



Flow diagram of Worthington centrifugal refrigeration system.

The volume consists of a channel around the impeller having an increasing cross-section which, as it winds around with a diminishing radius finds its way to the inlet of the second impeller.

The pressure at the circumference of the wheel is higher than the pressure at the inlet of the wheel, so in order to prevent internal leakage, the two must be separated from each other. This is done by employing labyrinth type seal rings between each impeller. These are

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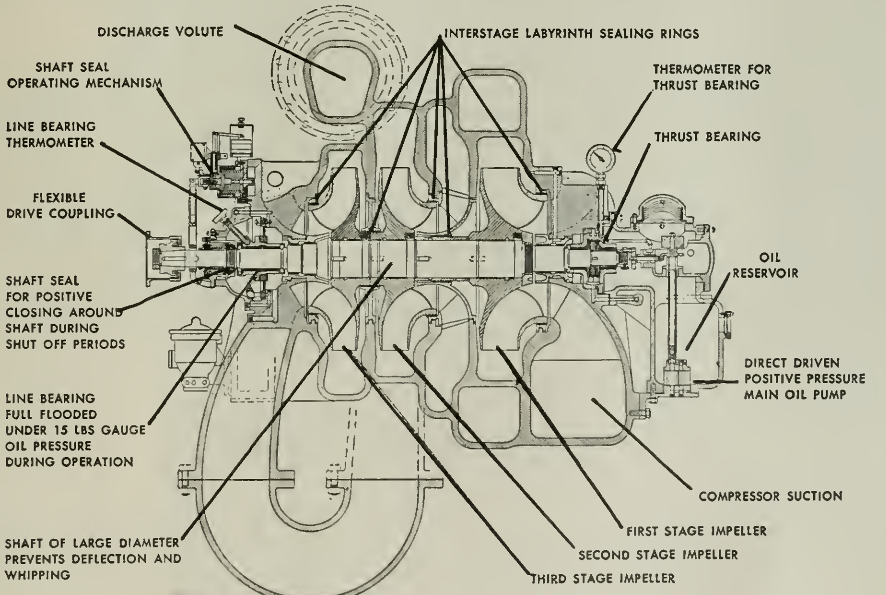


Sectional elevation of Worthington three-stage volute centrifugal refrigeration compressor.

Pacific WORLD TRADE

The food, merchandise and oil contained in all these railroad cars could all be loaded in the Hawaiian Builder, Matson's newly reconverted freighter. Actually, the Hawaiian Builder's cargo capacity is equal to 216 box cars, 32 refrigerator cars and 101 tank cars.

Photo courtesy Matson Lines

MATSON'S NEW FREIGHTERS

With a total cargo capacity equal to a freight train 2-8/10th miles long comprising 216 box cars, 32 refrigerator cars and 101 tank cars, the vanguard of a freighter fleet specifically designed for the Hawaiian trade went into service October 17 when Matson's newly reconverted freighter, the *Hawaiian Builder,* sailed for Hawaii.

The *Hawaiian Builder's* 100-day shipyard reconversion cost $750,000. She will be followed by the *Hawaiian Rancher,* now loading in New York for an October 25 island sailing. These two ships are the first of Matson's 15 C-3 type vessels to complete reconversion in the company's $27,000,000 postwar freighter fleet program.

The *Hawaiian Builder* was reconverted at the General Shipbuilding and Drydock Corporation yard in Alameda. Work on the *Hawaiian Rancher* was done in the Sun Shipbuilding and Drydock Corporation yards at Chester, Pennsylvania.

Huge refrigerator compartments, molasses tanks, bulk raw sugar holds, and fast loading and unloading gear were installed on each ship to Matson specifications designed specifically to meet the needs of island shippers and to speed delivery of cargo to and from Hawaii.

The *Hawaiian Builder's* 20 refrigerator compartments holding 62,500 cubic feet of perishable cargo have the capacity of about 10,000 ordinary household refrigerators.

The refrigerator compartments were purposely constructed on various sizes ranging from 1865 cubic feet to 4890 cubic feet so that cargoes can be segregated according to temperature and destination.

They were designed to maintain temperatures as low as 10 degrees below zero. Tests conducted on the *Hawaiian Builder* showed that her refrigerating system was capable of sustaining temperatures of 15 degrees below zero—five degrees lower than specifications. In addition, the "rise test" showed that, with the cooling system stopped, the refrigerators did not lose more than one and a half degrees per hour over a six hour period.

On the *Hawaiian Builder* and other ships of her type soon to be put into service by Matson, refrigerated cargo such as meats, fish, poultry, butter and quick frozen vegetables and fruits shipped from Pacific ports can be chilled sufficiently low on board to counteract exposure on the dock during unloading in Hawaii's semi-tropical temperatures.

On return voyages, frozen pineapple can be delivered to the railroad's refrigerator cars with temperatures sufficiently low as to allow the railroads to skip several icing stops on the way east, thus speeding delivery to eastern markets.

In addition to her "reefers," the ship has five huge cargo holds with a capacity of 520,195 cubic feet, liquid cargo tanks holding 65,620 cubic feet and four molasses tanks with a capacity of 2700 short tons.

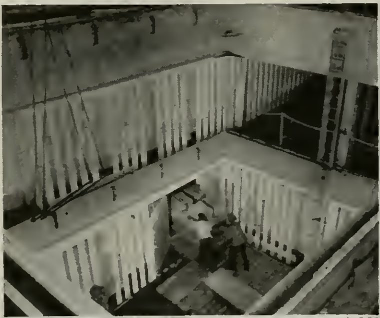
The ship's molasses tanks have coils which heat the molasses up to 100 degrees above zero as special pumps discharge it at a rate of 200 tons per hour.

The 7000 tons of bulk raw sugar hauled in the ship's raw sugar holds can be unloaded quickly with new conveyor and scraper systems.

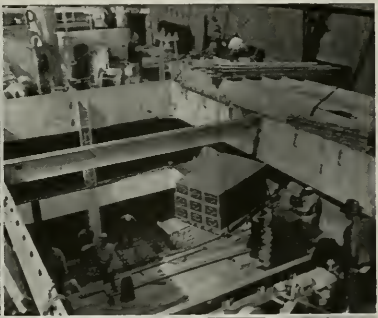
The *Hawaiian Builder* is equipped with ten sets of fast cargo handling gear with individual topping lift winches for each cargo boom to insure fast loading and unloading.

Pacific Coast Foreign Trade - August 1947

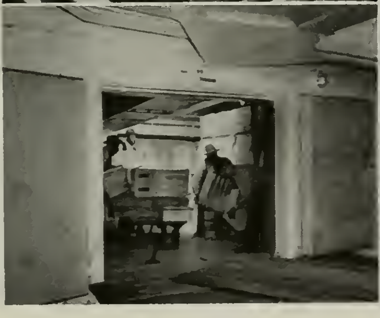
Customs Districts	Exports August 1947	Exports August 1946	General Imports August 1947	General Imports August 1946
Total Pacific Coast	$79,900,000	$54,500,000	$27,800,000	$25,100,000
San Diego	2,800,000	2,200,000		
Los Angeles	19,400,000	11,300,000		
San Francisco	30,700,000	21,000,000		
Oregon	9,300,000	10,300,000		
Washington	17,700,000	9,700,000		



At top, left: Perishable cargo being loaded into one of the 20 refrigerator compartments in the Hawaiian Builder. The refrigerators on this newly reconverted ship have a capacity equal to about 10,000 household refrigerators and chill perishables as low as ten degrees below zero.



At right: View of one of the five dry cargo holds in the Hawaiian Builder. These holds have a total capacity of 520,195 cubic feet. The total cargo carried by this vessel would fill 216 railroad box cars, 32 refrigerator cars and 110 tank cars — a train two and eight-tenths miles long!



Bottom, left: View of one of 20 huge refrigerator compartments for perishable cargo on the newly reconverted vessel. It cost Matson $750,000 to reconvert this vessel to meet the requirements of the Hawaiian trade.

At right: Head lettuce, celery and other fresh vegetables are loaded into refrigerators such as this on board the ship, outbound for Hawaii. In addition to its 20 refrigerator compartments, this newly reconverted Matson freighter has five huge dry cargo holds, bulk raw sugar holds, and molasses tanks.

Photos courtesy Matson Lines

Carl W. Gabrielson (right) raises the American President Lines' house flag atop the Maritime Building in Yokohama to commemorate the reopening of the company's offices in Japan. Assisting Gabrielson is Captain John E. Fish of Lykes Bros. Steamship company, for whom American President Lines is agent in Japan.

APL Opens Japan Offices

American President Lines' application for the reopening of its offices in Japan has been granted. Two APL ships—the *General Gordon* and *President Madison* were the first to operate privately in Japan since before the war. Approval of APL's application came from General MacArthur's headquarters.

Since V-J Day American shipping personnel, including APL's, in Japan has been on the staff of the U. S. Maritime Commission. Recently, the Commission took steps to return ship operations there to private hands, and APL made its application to MacArthur's headquarters accordingly.

Under the return to private operations, effective October 18, the *General Gordon* discharged and embarked passengers at Yokohama. The liner also loaded a cargo of porcelain, chopsticks, and dried seaweed for Honolulu discharge.

The *President Madison* loaded porcelain, electric bulbs, tea, canned crab, mink skins, Christmas decorations and silk goods for San Francisco and Los Angeles.

Both vessels sailed from Yokohama October 18.

American President Lines already has personnel and equipment "on the spot" and is prepared to carry out its operations there without any delay.

Pacific WORLD TRADE

Taylor Retires from Mackay Radio and Joins AFCUC

Stanley E. Hollis, president, American Foreign Credit Underwriters Corporation, a recent visitor in the Bay area, announces the appointment of David Mann Taylor as representative of his organization in the San Francisco-Oakland Bay area.

Taylor recently retired from the Mackay Radio and Telegraph Company as its foreign representative in this area and having been closely identified with the foreign trade fraternity for the last twenty years, is well qualified to assume his new duties.

Mr. Taylor begins his new activities at once as representative in the Bay area of the American Foreign Credit Underwriters Corporation.

With competition increasing, exporters are finding it necessary to revise their sales and credit policies. There is a need for authoritative facts and guidance relative to the financial and credit status, as well as the character and background of customers, prospects, sales representatives abroad. Helpful in meeting these and related problems are the world trade and credit services available through American Foreign Credit Underwriters. For some 30 years this organization has specialized in providing exporters with practical aids and useful services.

Effective as a developer of new business, as well as for checking credits, is AFCU's well-known Market Guide for Latin America. This Market Guide lists all the worth while importers, distributors, commission agents, etc., in Mexico, Cuba, Puerto Rico, the West Indies, and in all the South and Central American countries. Assigned to each listing is a double headed (Capital and Credit) ratings. A trade classifier and many auxiliary services are included.

AFCU also publishes Exporters Digest and International Trade Review (monthly in English) and America Industrial (bi-monthly in Spanish).

Thomas Mann Taylor

Shipping and Packing Risks

A. L. Sullivan

By A. L. SULLIVAN

Manager, North America Companies, Los Angeles

THE JUNIOR FOREIGN TRADE ASSOCIATION of Southern California has regular meetings which are addressed by speakers of authority. Secretary Bob Ruth reports that Mr. Sullivan was highly interesting and the film he showed informative and helpful in indicating packing and port conditions in various cities.

The short talk I am going to make has to do with World Port Conditions and the implications that these conditions have on our export business in many of its aspects.

This country with its vast productivity and wealth of natural resources and the basic premise of free enterprise is the only country in the world today possibly able to live within itself.

If, however, we are to aspire to a continuation of our way of life and of our world as we want it to be it behooves us all to interest ourselves in the business of international exchange of goods, namely the import and export business, and it is with some facets of the export business that I will deal briefly.

Much of what I have to say will be well known to all of you, but I still wish to stress some of the following readily understandable facts:

The exporter is only one of a team consisting also of the bank, the shipping company, the insurance company and, of course, the foreign buyer or consignee.

Each of the members of this team must cooperate with the others in order to insure the successful outcome of the ventures in which that team engages.

The function of the exporter is, of course, to find a foreign buyer who needs U. S. goods, and incidentally it is also necessary that the foreign buyer should have money to pay for the goods. In making this statement I am not considering governments in the light of exporters as we all know that our unfavorable export trade balance is largely due to shipments of goods through government agencies for which goods the foreign countries are unable to pay. The bank then comes into the picture and it is only through the operations of their foreign branches or through correspondent banks in foreign countries that the remittance of payments for the exports can be made to the shipper.

Ocean marine insurance has to be arranged to cover the goods in order to protect the financial interests of the parties in the goods being exported, and you are probably all aware that due to wartime and postwar conditions the cost of such insurance has mounted considerably.

One of the basic precepts of all forms of insurance is that the loss sustained by the unfortunate few shall be spread among the many, and in prewar years marine underwriters predicated their rates on the periodic vessel casualty, but the incidence of handling damages, such as theft, pilferage and breakage was relatively light.

Subsequent to the war this has ceased to be the case and the reason is not far to seek. Many ports in the world have suffered physical damage from bombardment, wharves have been destroyed, warehouses have been burned and other dock facilities have been destroyed or impaired. This has meant that cargo has had to be left in the open subject to damage by the elements and also to pilferage and wholesale theft.

The deterioration of ports is not only a physical one. In almost all parts of the world dock workers and all other handlers of cargo, and people coming in contact with the movement of ocean cargo have apparently made it a practice to steal and pilfer everything that they could lay their hands on.

This may sound as though I am crying about the woes of the ocean marine underwriter. Such is not the case as we can, and have as I have previously stated, increased rates to meet this deterioration and conditions.

The point I want to make is that in the interest of foreign trade the exporter should and must take every precaution to ship his goods with a view to minimizing the incidence of the type of loss I have instanced. There is nothing, of course, that the shipper can do to obviate the marine casualty wherein a vessel is in collision or strikes a submerged object, but there is a lot that he can do by way of packing his goods toward making the pilferage hazard less and in the case of breakable goods, by proper packing breakage can be minimized.

By so proceeding insurance charges can be reduced which will itself facilitate the export business. Another most important point is that by proper packing the goods will arrive at destination in sound condition and the consignee is in a position to put those goods on the shelves and make his business profit, rather than secure a cash indemnity for lost or damaged goods, which will serve to minimize the consignee's anticipated business profit on the transaction.

It frequently comes to our attention that exports are made in domestic type cartons, apparently due to the fact that the exporter is unfamiliar with foreign business and feels that the cartons which are adequate for domestic rail shipments are good enough for foreign trade. It recently came to our attention, for example, that a large shipment of crockeryware shipped from the Eastern United States destined for the Philippines was being shipped in domestic cartons. Upon investigation we found that the cartons being used were what is known as "90 pounds test strength" and the weight of crockery in each carton was between 85 and 87 pounds. To start with the weight of the crockery should not have been more than 60 pounds per carton, and due to the close packing of the crockery very little straw or excelsior could be used for separating the individual pieces of crockery, and by the time these cartons had arrived at the West Coast port for trans-shipment to the ocean vessel very substantial damages had already arisen. Such packing is obviously entirely inadequate for the ocean shipment, with the number of additional handlings and the normal, and to be expected, rough handling at an Oriental port.

Many types of shipment are considered adequately packed when in cardboard cartons, but such cardboard cartons should be of the VUS solid fibre box type, which today are readily available.

In order that the ocean marine underwriter may be fully familar with the varying conditions in all ports of the world, the Board of Underwriters of New York regularly supply reports from their correspondents from all such ports. This information is of constructive value to the marine underwriter and the same information can be of great assistance to the exporter.

Pacific
WORLD
TRADE

Hawaiian Sugar Production Lowest In Twenty-Five Years

The total Hawaiian sugar production for 1946 was 678,909 short tons of ninety-six degree polarized sugar, 141,719 short tons less than the 1945 production.

More than 180,000 tons of raw sugar were lost as a result of the seventy-nine day sugar strike which began September 1, 1946, according to the Hawaiian Sugar Planters Association. Under normal operations, H.S.P.A. said, the industry would have surpassed the 1945 production by at least 25,000 tons.

Because of lack of irrigation during the strike, considerable acreage was lost. Grinding, however, is once again under way and the industry's estimate for 1947 is 850,000 tons. Shipments to mainland refiners last year showed a decrease of 108,617 tons. December's shipment was ony 1,553 tons as compared with 39,918 tons a year ago.

BOOK REVIEWS

FOREIGN CREDITS AND COLLECTIONS by J. Rodriguez Sanchez, export manager of William Iselin & Co., Inc., published by Prentice-Hall, Inc. Size 6"x9", Price $6.00, 410 pages.

This book gives exporters and foreign traders a comprehensive, specialized treatment of the credits and collections problems of international commerce. Here are the actual findings of many years of experience by an export specialist—a careful observer who has also studied international trade in all its phases.

Many actual cases present the practical side of a highly complicated subject made easy by the author's gift of clear, simple writing. Sanchez answers for you the questions like these:

—how are foreign sales to be financed?
—is it safe to sell on sight draft?
—what risks does the seller assume when selling on sight draft?
—what documents are needed?
—under what conditions does a confirmed and irrevocable letter of credit carry recourse?
—when should the exporter discount his foreign bills at the bank?

A complete list of the pitfalls that sooner or later annoy the foreign credit man is given in a detailed chapter dealing with letters of credit.

CHARTERING AND CHARTER PARTIES by Henry B. Cooley, B.E., C.E., LL.B., M.B.A., published by Cornell Maritime Press, 154 pages. Price net $5.00.

This is a basic book on chartering, not case histories—for owners, charterers, or owners of cargo on chartered vessels, their representatives, and the lawyer with little experience in maritime law.

The author combines practical experience with legal training. He points out that much inconvenience and expense may be avoided by careful observation of the principles so admirably set forth in this book. The following chapter headings reveal the scope of the book.

Contracts; Agency; Form of Charter Parties; Construction of Charter Parties; Vessel, Cargo and Voyage; Compensation; Liability under Charter Parties.

CAPTAIN A. F. PILLSBURY

Captain A. F. Pillsbury

The firm of Pillsbury and Martignoni Inc. engages in the business of marine surveyors, ship brokerage, naval architecture, and marine salvage. This firm has a well knit organization, including experienced designers, surveyors, and salvage experts, with offices in San Francisco and in Wilmington, California.

The senior partner, Captain Pillsbury, is a marine expert of long and varied experience.

Born in 1864 into an old State of Maine shipowning family, he went to sea at the age of 15 and quickly worked up through the official grades to be master of sailing vessels. Before he changed ro steamers at the age of 28, Pillsbury had skippered a number of coastwise schooners including: *Mary Power; Thomas R. Pillsbury; Herald; Addie E. Snow;* and *Jennie Greenbank.* His last command in sail was the bark, *Saranac.*

In 1892 the young shipmaster brought the steamer *Progreso* through the Straits of Magellan with a cargo consigned to merchants in Los Angeles and San Francisco. He evidently liked what he saw inside the Golden Gate because in 1893 he brought out the steamer *Mineola,* not only laden with cargo but also with wife and daughter. The family settled in San Francisco and is still at home in the city of St. Francis.

For the next 10 years Captain Pillsbury commanded steamers for the Pacific Improvement Co. and for the Pacific Mail Steamship Company. Among his commands were; the *City of Sydney,* operating as an Army transport to the Philippines, during the Spanish war; and the old *San Blas* with would-be miners during the Alaska Gold Rush in 1900.

An interesting interlude at this time was the sea trials of the U. S. Battleship *Wisconsin,* built at the Union Iron Works and delivered in 1900, and on which Pillsbury was the trial captain.

In 1903 Captain Pillsbury came ashore to accept a position as surveyor with the San Francisco Board of Marine Underwriters. This kept him busily engaged until 1912 when he decided to enter business independently as a marine surveyor.

In April of 1917 his experience and dependability attracted the attention of General Goethals, then head of the Emergency Fleet Corporation of the U. S. Shipping Board, and he was called to Washington, and in May of that year was appointed a disrrict manager for the construction division of the Emergency Fleet Corporation with supervisory charge of all emergency shipbuilding in California. He promptly gave up all his private business and devoted his full time to organizing and placing an inspection and auditing force for all the shipyards.

Six months after the Armistice, in June of 1919, Captain Pillsbury resigned to resume private practice as a surveyor. A month later he formed a partnership with the well-known salvage expert, Captain Leb (Lebbeus) Curtis, to carry on business as marine surveyors and ship brokers. January, 1924 this business was merged into Pillsbury and Curtis, Inc. with the following firm members: Captain L. Curtis; Captain T. G. Curtis; T. L. Tomlinson; W. L. Martignoni; and A. F. Pillsbury. Some of the more important salvage jobs handled by this firm were: *Alameda, Manchuria, Anubic* and *Pleiades.*

In the '30s this firm became Pillsbury and Martignoni, Incorporated and is now very busy handling a number of large conversion and repair jobs.

In 1930 he was honored by being appointed to be one of the representatives of the United States at the International Load Line Convention held in London of that year.

At the age of 83 Captain Pillsbury still comes to his office every morning and transacts business. His long career, wide experience, and expert knowledge of ships and shipping entitle him to the position he holds in the minds of shipping men, "Dean of the Marine Fraternity of San Francisco."

MINKS, GIRLS!

A quarter of a million dollars worth of mink skins arrived in San Francisco October 29 on the American President Line's *President Madison.* Cargo on the *President Madison* represents one of the first shipments of Japanese products to reach the U. S. consigned to private importing firms.

The seventy-five cases of skins, valued at $254,690.00, are destined to Eastern markets. Among other Japanese products on board which symbolize the resumption of private trade between the two countries are substantial shipments of canned crab, silk goods, Christmas decorations, porcelainware, dried mushrooms and tea.

Marine Insurance

The London Letter

By Our United Kingdom Correspondent

262,000,000 Pounds a Year is British Foreign Premium Income

NO LESS AN AUTHORITY than sir Stafford Cripps, president of the Board of Trade, has stated recently that the total premium income of British insurance companies amounts to £350,000,000 a year, of which about one-half represents overseas business. This is believed to be the first authoritative statement on the foreign earnings of British insurance, for the Board of Trade returns include insurance with commissions and other earnings, and it has never been possible to arrive at any precise figure, so far as foreign business has been concerned.

In 1943 the late Mr. Neville Dixey, of Lloyd's, addressed a gathering in London on "Insurance as an Invisible Export." He estimated the value of insurance, in that respect, at £15,000,000, with a further £5,000,000 represented by the interest on the foreign investments of British insurers, making £20,000,000 in all.

To return to Sir Stafford Cripps, he spoke of the premium income of British companies, and it must be assumed that he took no account of the premium income of Lloyd's underwriters, which is always unascertainable, no information being divulged. If, however, we take the figure of £175,000,000 as the foreign premium income of the company market, and add one-half of that amount as representing the foreign premium income of Lloyd's underwriters, we arrive at a figure of about £262,000,000. If the profit on this business is placed at 6 per cent, we arrive at a figure of £15,720,000, which is near enough to Mr. Dixey's estimate. As insurance requires no raw material, no imports for re-export, and is conducted with overhead charges which are very slight compared with those of manufacturing or processing, the value of insurance as an export becomes more and more obvious.

The Argentine Insurance Law

Another matter mentioned by Sir Stafford Cripps was the new Argentine insurance law. Here I may mention that there is a strong body of opinion in the United Kingdom that Argentina is adopting a short-sighted policy in confining national insurance within the nation to as great an extent as is possible. To carry out this policy, the Mixed Reinsurance Institute has been set up, in which the bulk of the business transacted in Argentina must be reinsured compulsorily. While it is true that the Mixed Institute will be reinsured, itself, by Argentine companies, and that some business will be reinsured abroad, the main effect of the new law will be to concentrate the national insurance business within the nation. Thus, the Argentine Government will be carrying the catastrophe risk to a very large extent. Any major loss will be centralized within the nation, instead of being spread over the whole insurance world.

Insurance Conference at Cannes

The second postwar conference, at Cannes, of the International Marine Insurance Union has duly been held, and marine insurance people here are unanimous that the gathering was both constructive and interesting.

Of the numerous subjects discussed, that of theft and pilferage, being an international problem, is of more than momentary interest. Harold H. Mummery, chairman of the Institute of London Underwriters, spoke of the various committees in England concerned in the theft and pilferage problem. It was, he said, not the attitude of underwriters to sit back and take high premiums for covering the risk. It was their duty to help reduce shippers' costs.

Of the vital matters discussed at the Conference, and too numerous even to mention in this necessarily restricted summary of marine insurance events, the hull situation is of general interest. A. B. Stewart, chairman of the Joint Hull Committee, outlined the development of the "Joint Hull Understanding", with special emphasis on the controlled reductions in rates of the postwar period. This, he said, was an attempt to conduct business on scientific lines, emphasizing that it is important for all parties to have a stable market rather than one in which violent fluctuations occurred.

Admiralty Decisions

By HAROLD S. DOBBS *of San Francisco Bar*

State vs. Maritime Law

In order to determine whether or not a particular cause of action falls within the limits of the maritime law of the United States as distinguished from the state law with reference to injury or death suffered by persons in or about a ship it becomes necessary to ascertain the place of injury together with other factors which, according to accepted rules of law, determine the maritime jurisdiction or the state jurisdiction. The determination of which I speak becomes extremely important after an action has been filed by either the injured person or his representatives. The court might be confronted with the question of whether to apply the law of the state in which the action is filed or, on the other hand, that of the United States as it is specially and particularly devoted to maritime interests.

A very recent case decided in the Court of Appeals of the State of New York in May of this year makes it quite clear that state law must bow to federal maritime law where it is first determined that the jurisdiction is maritime in nature. The case to which I refer is that entitled *Emma Riley, Administratrix Estate of William Riley, deceased, v. Agwilines, Inc.* The action is one for wrongful death of the intestate, William Riley, who while working as a stevedore on the *SS Medina,* owned, operated and controlled by Agwilines, fell through an uncovered hatch in an unlighted part of the deck immediately below the top deck of the vessel. The lower court entered a judgment in favor of Emma Riley as administratrix and against Agwilines. The facts, as related through testimony obtained at the trial, indicated that Riley was working along with other longshoremen employed by the Jarka Corporation, an independent contracting stevedoring group aboard the *SS Medina* who were engaged in removing ballast and cargo from the vessel. The longshore gang of which Riley was a member carried on their work in a routine manner and as evening approached obtained the use of lights which were lowered through the holds and were moved from time to time by the longshore gang when they required light in various portions of the hold. Riley, in an apparent attempt to leave the hold, fell through the hatch to his death below. The hatch covers had been removed by members of the gang working the No. 2 hatch pursuant to directions of their foreman employed by Jarka. Riley had been working in No. 3 hatch.

The question of law presented is whether under these facts, which are indisputable, the owner of the ship became liable for the wrongful death of Riley. The court correctly concluded that it is beyond the power of the state by legislation or judicial decision to mold or modify the maritime law.

The principle just stated is well established by virtue of the case of *Knickerbocker Ice Co. v. Stewart* decided by the United States Supreme Court in the year 1920. In the *Riley* case the court continued by stating that we must look to the decisions of the federal courts to define the liabilities of ship owners for maritime torts, leaving out of consideration decisions of our own state courts, or statutes of our state as well, which conflict with the rules of liability established in the federal courts. There are a number of cases that are still considered to be good law that substantially agree with the statement made.

A case was decided in the New York courts in which the instant case was tried where an action was instituted to recover damages for wrongful death under a New York statute. The court in the earlier New York case stated that because of the location of the accident, which was aboard a vessel, the matter was not of local concern and, therefore, the substantive rights and obligations of the parties arose, not out of the local law of New York, but rather under the maritime law of the United States. The court correctly recognized that state courts as well as federal courts may have concurrent jurisdiction to entertain the suit; however, if the action is brought in the state court the principles and rules of the substantive maritime law are alone to be applied as ground, if any, for recovery.

In the instant case the jury was instructed that the ship owner (Agwilines) was under an *absolute non-delegable duty* to see that light was furnished at No. 2 hatch and could not relieve itself of that duty by showing that it had engaged Jarka, the stevedoring company, to do the work. The ship owner appropriately excepted to these instructions. The court found that it was the stevedoring company, not the ship owner, who removed the hatch covers and left the hatchway unguarded and unlighted. The ship was properly equipped with facilities for supplying adequate light which were made available to the longshore gangs aboard ship. These facts were indisputable. The maritime law does not impose liability upon the vessel or its owner when a longshoreman employed in loading or discharging the vessel is injured because of the manner in which the longshoremen carry on their work or because of their failure to use appliances furnished for their use, including lights available for lighting the 'tween decks or other parts of the ship where the work is done. There are cases that hold that the ship owner is not negligent for failing to keep all of the cargo hatches closed while the vessel is in port. The reason for the rule is obvious in that the vessel while in port is primarily engaged in receiving and discharging cargo and the activities could not very well be carried on or the holds ventilated without permitting the hatches to remain open. The only requirement of the ship owner is that his vessel be seaworthy. In other words the equipment, tackle and machinery must be in order, and if there be defects in such gear resulting in injury the ship owner will be liable not only to the members of the crew but to stevedores as well.

The administratrix apparently misconceived the basis of the decision of *Seas Shipping Company v. Sieracki,* decided by the United States Supreme Court last year. In that case, as you will remember from one of my previous articles, the ship owner was held to be under an absolute non-delegable duty to provide a seaworthy vessel. The longshoreman injured in that case was permitted to recover from the ship owner, even though he was employed by a stevedoring contractor, simply because he was able to prove that the vessel was unseaworthy due to defective equipment and machinery. There were no such defects in the instant case. The omission constituting negligence in this case was that of the stevedoring contractor in failing to use the lights that were at hand. The Appellate ourt reversed the judgment so that it might be in favor of the ship owner and ordered the complaint dismissed. I am happy to note that the court carefully distinguished between the facts as presented here and those of the *Sieracki* case because without the distinction a ship owner would find himself subjected to claim for any injury suffered by one not a member of the crew regardless of how or under what circumstances it may have occurred aboard the vessel.

Right to Sue Under Jones Act

It is pretty well established and understood that a seaman's right to recovery for personal injury or damage of any kind arising out of his employment aboard a vessel must be founded under the terms of the Jones Act, 1946 U. S. Code 688. In an action entitled *Miller v. T. H. Browning Steamship Co., Inc.,* decided by the United States District Court for the Western District of New York, the plaintiff was given the record verdict of $77,000.00 for damages resulting from a fall into the hold of the merchant steam vessel *Sultana.* It was rendered in an action filed under the Jones Act. At the end of plaintiff's case and again at the conclusion of the evidence, defendant moved for a directed verdict and, in the alternative, for a new trial. In this proceeding the court is confronted with a motion to set aside the verdict. The motion particularly brings up for decision the question of whether the plaintiff's injuries were sustained in the course of his employment as a seaman so as to entitle him to sue under the Jones Act. The court summarized the facts as follows:

> "The defendant had a contract with the Seafarer's International Union which provided among other things that in the hiring of all employees the defendant should first call the union to furnish competent help and in case the union was unable to do so, the defendant itself might hire such help. One McLean was the Port Agent of the union. It was his duty to ship unlicensed personnel aboard the boats at Buffalo. The first assistant engineer of the *Sultana* told McLean 'to ship an oiler.' McLean sent Miller the plaintiff to the union office to obtain clearance for the *Sultana.* He got a clearance slip which read, 'The bearer M. Miller is hereby certified as competent to fill the position of oiler on the steamer *Sultana.* Signed, A. McLean.' Miller went with his gear to the ship. He ascended by means of a ladder from the dock to the ship. As he was proceeding aft along the deck to report for work, he fell into an open hatch."

One of the fundamentals in any Jones Act suit is the existence and proof of the conventional relationship of employer and employee. The statute was designed to cover the relative rights and obligations of seamen and their employers arising out of personal injuries sustained by the former in the course of their employment. The Act does not purport to change the definition of "seamen" so as to do away with the necessity of a contractual reationship of employment to serve on board a vessel. The plaintiff, when he sustained his injuries, had not yet reported to any of the ship's officers nor had he been accepted as an employee nor had he signed ship's articles or received orders from anyone aboard the ship to do any work. He was free to leave the ship for any arbitrary reason of his own and the defendant could not have exercised any control over him as an employee. He was simply a prospective employee. The court, in my opinion, correctly concluded that Miller had not attained the status of an employee at the time he sustained his injuries. The injuries, therefore, were not sustained in the course of his employment so as to entitled him to sue under the Jones Act. The court ordered judgment in favor of the defendant on the motions previously made.

Forfeiture

Under 49 U. S. Code, Section 781 and Section 782, the United States of America can declare a forfeiture of a boat as it did in the case of *United States of America v. Yacht Harpoon II and Motor Tender No. 4K350,* decided by the United States District Court for the District of Massachusetts, where it finds contraband aboard. The section referred to makes it unlawful for a vessel to transport or to conceal or possess contraband. The owner of the *Harpoon II* and Motor Tender claimed that the contraband was placed aboard the boat by some unknown person, and, secondly, that there had been a bona fide transfer of the boat to a purchaser for value prior to the declared forfeiture. The court found that the intention of the framers of the code indicated that the mere finding of contraband aboard a vessel would be sufficient to permit a forfeiture regardless of the manner in which it was placed there. The court also concluded that even a transfer of the vessel to a bona fide purchaser for value would be no defense. The court relies upon a number of cases that hold that the forfeiture takes place upon the commission of the forbidden act and the statute operates to transfer the title at once to the government so as to avoid all subsequent sales of property however innocent the purchaser may be. The decree was prepared in accordance with the above.

Merchant Marine Reserve Program

Merchant Marine Officers holding unlimited licenses are eligible to join the M.M.R. Rank is assigned on the basis of position held, length of service, age, and size of vessel serving in. Documents required are birth certificate, (or naturalization papers), record of previous military service, letters from owners and Masters or Chief Engineer of satisfactory service, and license. These must be sighted by the procurement officer. A Physical examination and intelligence test are given. The Office of Naval Officer Procurement is located on the 3rd Floor of the Ferry Biulding, San Francisco, California.

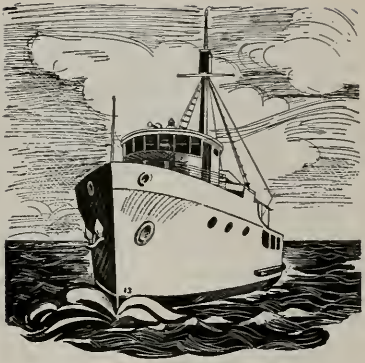
Officers cannot be called to active duty in time of peace, without their consent but are allowed two weeks training duty per year, either afloat, or at the Damage Control Training Center located at Treasure Island, where a fine course in fire fighting and damage control is given. There are also a limited number of openings for junior officers who have not had previous active duty, for training afloat, for periods of one year, and for 56 days.

The Navy also has many correspondence courses available. They consist of Navy Regulations and Customs, Military Law, Seamanship, Communications, Ordnance and Gunnery, Navigation (2 courses) International Law, Naval Engineering and Electricity (2 courses) Diesel Engineering, Elementary Nuclear Physics, and Foundations of National Power.

Two merchant vessels have been warranted in the Twelfth Naval District, as being acceptable as Naval Auxiliaries in time of war. They are the cargo liner *Hawaiian Planter* and the passenger liner *Matsonia.* The requirements for a warrant are that the vessel be acceptable as an auxiliary, and that the master, and 50 per cent of the officers are members of the Naval Reserve. It is expected that several more vessels in this district will be warranted in the near future.

Captain F. Wauchope, DM, USNR, is the Merchant Marine Reserve Representative for the Twelfth Naval District, and is located in Room 233, Federal Office Building, San Francisco, California. All Reserve officers, and those seeking further information are cordially invited to call.

Coast COMMERCIAL CRAFT



SANTA FE TUG JOHN R. HAYDEN JOINS MARINE FLEET

The Tug *John R. Hayden,* newest addition to the Santa Fe marine fleet plying San Francisco Bay, is of welded steel construction, 149 feet long, 581 tons gross weight, and has a 1200 horsepower, 3-cylinder, Unaflow, marine type, reciprocating steam engine manufactured by the Skinner Engine Company.

The craft was built by the Tampa Marine Company, Tampa, Florida, from an original design by W. C. Nickum and Sons, naval architects and marine engineers, Seattle. It was built under special survey of the American Bureau of Shipping, with freeboard for ocean-going operations.

Deck machinery consists of a towing engine, made by Almon A. Johnson, Inc., on the main deck aft and an anchor windlass on the main deck forward. Both are powered by steam.

The craft has 2708 square feet of boiler heating service and boilers are marine type, straight tube with two oil burners, built by Babcock and Wilcox.

Ample working facilities for a crew of seven and one bargeman, together with a modern galley for their use, are provided.

Like other units of the Santa Fe fleet, the *John R. Hayden* is equipped with two-way radio to facilitate

View of the John R. Hayden, 149 foot, 581-ton, 1200 hp, all steel tug of the Santa Fe Railway marine fleet, in operation in San Francisco Bay.

movement of car barges between Ferry Point and points in San Francisco, Alameda and Marin counties. The Hayden's radio is Bendix.

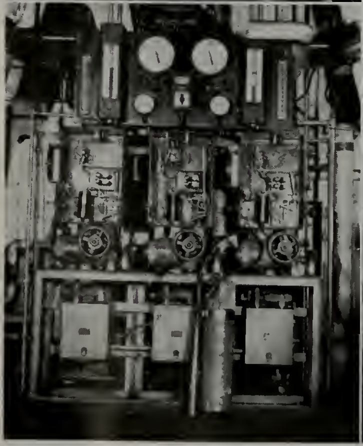
In addition to its main function, the vessel may also be used as auxiliary equipment in fighting waterfront fires, being equipped with Worthington pumps and fire-monitor. Additional protection for the vessel and those aboard is provided by hose outlets strategically located, a Walter Kidde carbon dioxide extinguishing system, and a steam smothering system for oil storage tanks.

Tugs of this type played an important role in World War II, being used by the Army Transportation Corps in the Pacific and European waters as well as those of the United States. In the September 1946 issue of Pacific Marine Review reference was made to one of these in connection with goedetic work in the South Seas for the Philippine Government.

▲ Silhouetted by Captain Craig and the pilot house windows is the San Francisco-Oakland Bay Bridge as the John R. Hayden starts its run across the bay.

◄ Left: J. F. McColgan, chief engineer of the John R. Hayden at the throttle.

At right: Forward windlass and the head tow lines of the John R. Hayden, Santa Fe tugboat.

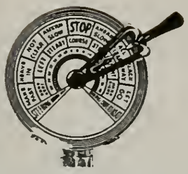


◄ Left: Combustion control panel showing the automatic oil control in the center box while the two side boxes operate the forced drafts; also the steam gages, water glasses and Pyrometer.

At right: Chief Engineer J. F. McColgan adjusts the automatic water feed in the boiler room.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

THE RULES OF THE NAUTICAL ROAD

Steering and Sailing Rules, Preliminary

IN LAST MONTH'S ARTICLE we discussed the various interpretations and court decisions relative to the fog rules. This month we present a series of explanatory notes and comments on several of the more commonly misinterpreted steering and sailing rules.

"Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist."

Note: Danger bearings, frequently taken, will quite often give definite warning that risk of collision exists. Such bearings should always be taken, by *both* burdened and privileged vessels. It does not follow, however, that in all cases where the bearing is changing no risk of collision is involved. It may not be changing rapidly enough to insure a wide clearance, and a vessel is not upheld if she enters into a nicety of calculation which results in a collision. Then, too, the other vessel may not see you and suddenly change her course, she may slow down, speed up, break down, or in any number of other ways suddenly precipitate a collision situation even though your series of carefully taken bearings has led you to believe that no risk of collision exists. In various decisions the courts have held that both vessels are obliged to take danger bearings, and that you are not justified in assuming that there is no risk of collision just because there is an appreciable change in the compass bearing.

Inland Article 18, Rule 5. (Paragraph 1.)

"Whenever a steam vessel is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steam vessel approaching from the opposite direction can not be seen for a distance of half a mile, such steam vessel, when she shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam whistle, which signal shall be answered by a similar blast given by any approaching steam vessel that may be within hearing. Should such signal be so answered by a steam vessel upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but, if the first alarm signal of such vessel be not answered, she is to consider the channel clear and govern herself accordingly."

NOTE: The "long blast mentioned in the article above is understood to mean a blast considerably longer than the 4 to 6 second prolonged blast, a blast of about 8 to 10 seconds being acceptable. No confusion in this rule exists if the long blast is not answered, no further signals being necessary. It may be noted, however, that the words "govern herself accordingly" which the vessel is directed to do if she does not hear an answering long blast should not be understood as permission to relax her vigilance, but rather as a warning to keep a sharp lookout and remain on the proper side of the channel until the passage is actually known to be free of other traffic.

If the vessel's long blast *is* answered, then we apparently have two conflicting rules regarding when passing signals are to be exchanged; for while Rule 5 of Article 18 states (as above) that the passing signals are to be answered *immediately* after the long blast is answered, Rule 9 of the same Article 18 states that whistle signals used for passing are *never* to be used except when vessels are in sight of each other. This reveals a conflict in the rules that usually is not apparent to the casual reader. The proper procedure is for the steamer to obey Rule 9 of Article 18. The word "never" is much stronger than the word "immediately," and the rules are interpreted to mean that the steamers will exchange passing signals *immediately upon sighting each other,* but not before.

Inland Article 18, Rule 5. (Paragraph 2.)

"When steam vessels are moved from their docks or berths, and other boats are liable to pass from any direction toward them, they shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the berths so as to be fully in sight they shall be governed by the steering and sailing rules."

NOTE: A vessel leaving her berth bow first follows the literal rule, gives the long blast, and after she is clear of her berth and under command on her settled course is then "governed by the steering and sailing rules," exchanging the proper passing signals with any vessel in sight and passing by. The rule has been modified, however, as regards a vessel backing out. The long blast must be followed by the usual three short blasts if another vessel is in sight. Further, despite the rule which says that when she is fully in sight she shall be governed by the steering and sailing rules, it has been decided that she is under *Article 27, the rule of special circumstances,* until she is settled down upon her course. It is the custom among pilots to consider the stern as the bow when the vessel is backing, and give passing signals accordingly. While this custom enables them to arrive at a proper passing signal to propose to another vessel, whenever one vessel is backing these signals are proposals only, and not legally upheld as a matter of definite right under the rules of the road. This is because a vessel, when backing, is not under certain control. It is well to remember, therefore, that when either vessel involved in a situation is backing it is Article 27 that applies, and *both vessels are burdened,* with the regular steering and sailing rules not applying until the backing vessel is settled down upon her course.

International & Inland Article 25.

"In narrow channels every steam vessel shall, when it is safe, and practicable, keep to that side of the fairway or midchannel which lies on the starboard side of such vessel."

NOTE: This rule is an important one, and although a certain leeway is given in the rule by the use of the words "when it is safe and practicable," in the event of a collision the burden of proof that it was not safe for the vessel to have kept to her starboard side would lie heavily upon the vessel. Circumstances that make it necessary for a vessel to operate upon the left side of a channel are extremely rare, although it has been held that a vessel may operate in midchannel if there is sufficient room on the port side for a vessel to safely pass. In Inland waters, however, in certain cases Article 25 has been superseded by local rules, such as the rule in New York harbor that requires all vessels navigating the East River to keep to the center of the channel. This of course is to avoid the danger of collision between a vessel hugging the starboard side of the channel (which is lined with piers) and a vessel leaving her pier. A further note to the narrow channel rule is that if one of two vessels meeting in a narrow channel must stop, it is the vessel stemming the tide that must do so, rather than the vessel running with the tide.

International & Inland Article 27.

"In obeying and construing these rules due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger."

NOTE: In a few words, this is the meaning of Article 27—*All vessels must follow the rules of the road for as long as possible, but they must depart from the rules if necessary in order to avoid immediate danger.* A common mistake among students of the rules is to assume that whenever risk of collision exists the rules, except Article 27, cease to apply. This is not true, as the rules are so designed that they will hold up in any reasonably close situation. The only exception, when the rules are not to be followed, is when there is immediate danger. This danger must be very close before the rules may be disregarded. Another important fact to remember about Article 27 is that when it is invoked neither vessel is privileged, but both are burdened and required to navigate with caution. Captain R. F. Farwell, in his critique of the rules, has enumerated several examples of circumstances under which Article 27 does and does not apply:

The above rule may be properly invoked . . .

1. Whenever the situation is not covered by the rules. (For example, when one or both vessels are backing.)
2. Whenever a situation simultaneously involves more than one vessel.
3. When physical conditions that should be apparent to both vessels prevents compliance with the rules.
4. When action contrary to the rules is proposed by one vessel and accepted by the other.
5. Whenever the approaching situation reaches the condition "in extremis." (When action by the burdened vessel alone will not avert collision.)

The rule does not apply . . .

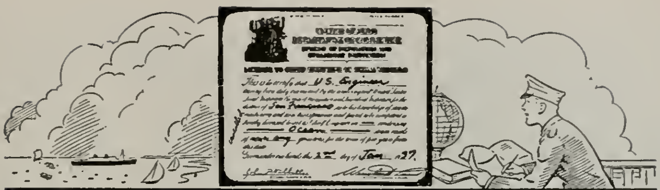
1. When it is a matter of convenience to disregard the rules.
2. When following the rules would result in a delay in the voyage.
3. When the alleged danger is too distant.
4. When it is suspected that the other vessel will not do her duty.
5. When the wrong action is taken because there is not time for overlong deliberation.
6. When the compass is defective.

International & Inland Article 29.

"Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case."

NOTE: The meaning of Article 29 might be interpreted as follows: *All vessels must follow the rules of the road, but if full obedience to these rules is not enough, all vessels must take any additional precaution which may be required under the custom of good seamanship.* A few examples of precautions which are not

(Please turn to page 88)



Your Problems Answered

by "The Chief"

"The Chief's" department welcomes questions—Just write "The Chief," Pacific Marine Review.

"CHALK TALKS" ON APPLIED MATHEMATICS

Blackboard Figures 1 to 6 mentioned in the text.

Stayed Surfaces for Pressure Vessels and Boilers

WE HAVE PROMISED TO DEVELOP the formula for stay bolts and stayed surfaces, but find the two subjects too much for one article. This article will discuss the area to be stayed and the pitch of the stay bolts. The bolt itself will be covered next time.

These problems are frequently found in the License Examinations for several reasons, one of which is that they involve *squares* and *square root*. In some future article we will discuss these mathematical terms and develop the system of getting a square root.

The stress in the steel of a stayed surface cannot be calculated with the clean cut analysis of other forms of stress. In the blackboard sketch, Fig. 1, the stay bolts are shown located at a horizontal pitch of P and a vertical pitch of p. But our analysis must be based on the equality of P and p. When they are different, and the General Rules allow us to make p smaller than P by as much as one half, the analysis becomes very difficult, if not impossible, and an arbitrary of empirical adjustment of the formula is made based on good judgment, experience, and a generous safety factor. In the figure the deflection of the steel plate is very greatly exaggerated. Uniform loading due to the pressure is shown on top and the reaction, or resistance to this loading is shown located at the position of the stay bolts. The thickness of the plate is shown as H in inches as we must reserve the usual symbol T for thickness for a later part in this analysis. See Fig. 3.

Figure 2, shows an enlargement of the section of the plate under uniform loading and deflected. It is to be noted that only part of the plate is in tension, that part shown as lines representing the lines of stress along the section. Note the upper part of the section is in compression, stress shown as a dotted area. There is a small area in this section that has neither compression or tension, and therefore, is not useful metal except insofar as it resists longitudinal shear. This will be discussed in some future article. In any case, it is clear that we have the same problem here as with a horizontal beam with a uniform vertical load. And here, as with beams, the strength is proportional to the square of the thickness of vertical dimension. That is, doubling the thickness will give four times the strength (2^2 is 4.)

As shown in Figure 2, the strength to resist uniform loading is nine times the tensile strength of the steel, times the thickness in inches, squared. This is somewhat empirical. For one reason no statement of the amount of deflection is given. Obviously we could carry more load at more stress if we would allow more deflection. The study of deflection of materials under load is a very interesting part of mathematical analysis. No attempt will be made in these articles to develop this unless our readers indicate an interest by writing to "The Chief." For the moment then, it is enough to say that the deflection here for a given loading, and steel of a given elasticity, is proportional to P^4 (to double P gives 16 times the deflection. 2^4 is 16) and is inversely proportional to H^3. (To double thickness is to have ⅛th as much deflection). (2^2 is 8 and inverse ratio gives one over eight or ⅛).

Also the loading shown in Figure 2 as $2WP^2$ is empirical. WP^2 would appear to give us the pounds load on the area between four stay bolts, thus the load on one bolt on this area is supported by four bolts, ¼ of each of which is available for this area. But we are not considering the load on a bolt here. (See next article.) We are considering the load on the plate as a beam suspended between the bolts. While it is the load on top of the plate it is not clear how it is the loading of the steel in tension in the plate section. We will have to accept as a truth that the loading of the fibers of the steel in tension is about $2WP^2$ as this works out in practice.

As further shown in Fig. 2, developed from equating the load and the strength we solve for W by simple transposition. And if the ratio of two different pitches P and p is not more than two to one, we can further adjust the formula for W by substituting P^2 plus p^2 for the original $2P^2$.

Figure 3 then shows this formula extended, using a usual figure of 50,000 for S, the tensile strength of steel. Then assuming a reasonable safety factor we have a value for W in terms of plate thickness in inches.

For some reason which "The Chief" is unable to explain, and with which he does not agree, the Marine Engineering Regulations as issued by the Coast Guard measures the thickness of the plate in sixteenth inches. This must be most confusing to the engineer who is trying to learn these Regulations as there is no apparent reason for it. We might as well state some of our formula in inches, some in millimeters and some in feet. "The Chief" invites discussion of this point. Anyway, the Regulations have it in 1/16th so we must cut our formula over to this odd unit. There are 16 of these odd units in our standard inch by definition of the unit. Therefore, our symbol T for thickness in 16ths will represent a number 16 times as large as the number would be if we used inches. In order that our formula will still be correct and give working pressure in pounds per square inch, we will divide our H in Figure 3 by 16. Then when we square the H we square the 16 also, giving 256 and dividing this into the rather large constant of 90,000 we have 312 as a constant, and designate it as C in the formula. The value of C will change with the steel used and the place in the boiler where the stayed surface is and by the safety factor deemed desirable by the Regulations.

Seventeen different values of C are listed in the Regulations, page F-80 varying from 136 for stays screwed into the plate located away from the fire or smoke, to 340 for plates stayed with bolts having nut on both sides of the plate and not exposed to the products of combustion. All of these values for C are based on steel having a tensile strength S of 55,000 psi (pounds per square inch) or more.

Solving for P is a matter of transposition, as shown in Figure 4. Note that if the bolt and plate are reinforced by plates or washers called "doubling plates," then the new thickness is the sum of that of the main plate and the doubling plate, and this in sixteenths is called T_1. Different values are given in the Regulations. Otherwise the formulas remain unchanged.

Again, if we have the pressure and the plate thickness given we have to solve for the allowable pitch. This is simple if the pitch is uniform. When it is desirable to have one pitch p less than the other P, we proceed as in Figure 5. The Regulations give us formula (23) as shown without explanation. But what this amounts to is that we calculate pitch as though P equals p, then increase this by a multiplier of 1.226, then calculate the other pitch as shown in Figure 6. This multiplier is empirical, based on experience and the formula is modified so that we use simple numbers. See Figure 5. Here it is shown that the multiplier 1.226 really amounts to putting a 2 in front of the square root sign in Figure 4, and changing the 2″ to 5″ to give formula (23).

Figure 6 shows how formula (24) of the regulations is derived from that in Figure 4.

The determination of the surface to be stayed involves some study and is covered quite carefully in the regulations. All of the requirements are empirical and not subject to mathematical analysis.

Our next article will derive the formula for the size of the stay bolt or stay rod, and will account for straight as well as a diagonal stay.

New Radar Classroom at Seaman's Institute

A school to teach the use of shipboard radar equipment to masters, mates and pilots was opened on Monday, October 13, in the Merchant Marine School of the Seamen's Church Institute of New York, 25 South Street. A classroom for this instruction has been remodeled, equipped, and will be staffed by the Sperry Gyroscope Company.

On the Ways

New Construction - Reconditioning - Repairs

Steel-Bilt Cruisers

Roy B. and Warren Thompson, brother-owners of the Steel-bilt Cruisers Company in Oakland, have recently inaugurated a new departure in the construction of power pleasure cruisers on the Pacific Coast. Whereas heretofore this type of craft has been made of wood, Steel-bilr Cruisers, as the name implies, is fabricating them from steel. Bethlehem Pacific's corrosion resistant, high tensile strength Mayari R is being used entirely in the bottom and side plates and in the cabin top and pilot house sides and top. Ten gage is used on the bottom and sides, and 12 and 14 gage on the cabin and pilot house.

Steel-bilt Cruisers are 33 feet long, have a 10½-foot beam and a 3-foot draft. The single screw model is powered with a 115 hp gasoline engine; the twin screw model with two 115 hp gasoline engines. The craft's extremely low center of gravity results in excellent stability, and the Thompson brothers report the steel hull is virtually vibrationless, damage-proof and requires a minimum of maintenance. They are using Mayari R because they say it does not buckle like mild steel when welded, or wrinkle when formed for such difficult curves as the reverse flare bow plates or the curved stem plates. Because of its greater strength, its use necessitates fewer internal frames and makes for greater safety in the bow. It will not dent like mild steel. All told, 7500 lbs. of Mayari R are used in the vessel's construction.

Cost of a single screw Steel-bilt Cruiser runs around $8500, completely outfitted. This is between $6000 and $7000 less than a wooden vessel of the same size and appointments.

Another feature is the short time required to build a steel pleasure cruiser. The Thompsons say that soon they will be able to turn one out completely outfitted in 45 days. This is in comparison with 3 to 4 months required to build a wooden cruiser of the same size.

The twin screw Steel-bilt Cruiser has a top speed of 25 knots, the single screw 15. It will sleep six, is equipped with a galley and boasts a shower.

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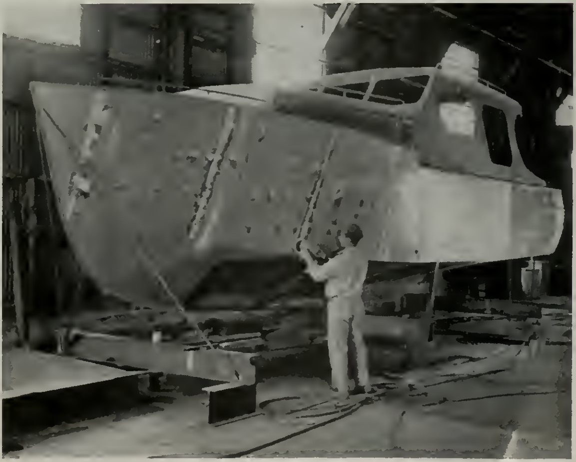


The photo shows a workman putting finishing touches on the completed hull of a new Steel-bilt Cruiser before it is launched.

THE LADY TAKES A SHOWER

The 10,969 d.w. ton Seatrain New Jersey gets a shower from a worker at the Todd Hoboken yard aiming a hose which shoots the cleansing spray out under 250 lb. pressure, to prepare the hull for a quick painting job by washing away barnacles, sea "grass" and other marine growths. The vessel is now back in her regular run to Havana and New Orleans, after cleaning and straighteninig her four-bladed propeller, which was somewhat damaged from a previous scape with an under water obstruction.

The Corps of Engineers' Survey Boat Robert Gray upon completion of her observation tower.

Bethlehem Repairs the Robert Gray

By F. S. McGuigan, manager
Bethlehem Steel Company
Shipbuilding Division Alameda Yard

Soon to become a familiar sight in Northern California coastal waters from Monterey to Crescent City is the Corps of Engineers survey boat *Robert Gray,* which has just been completely overhauled at Bethlehem's Alameda Yard and fitted with an observation tower, first of its type ever to be installed on a ship. It has the appearance of a second stack giving a rakish profile to the craft.

The *Robert Gray,* which was built at Lake Washington in Seattle in 1937 for operation as a Corps of Engineers survey vessel in the Portland, Oregon, district, is 117 feet long, has a beam of 25 feet and a gross tonnage of 265. It is powered by two 6-cylinder, 4-cycle, 360 hp diesel engines, both of which were completely dismantled, overhauled and reassembled at the yard.

From 1937 until 1942 the vessel made hydrographic surveys along the Columbia River. In that year she was taken over by the military and operated in Alaskan waters between Seward and Adak by the Army Transport Division as a tug boat (LT 666).

Early last year she was declared surplus by the Army and transferred to the San Francisco district of the Corps of Engineers who brought her down under her own power. She replaces the 20-year-old H. L. Demeritt whose activities have been largely confined to the Bay Area and which is now being retired from service.

One of the high lights of the work performed on the *Robert Gray* at the Alameda Yard was construction of an observation tower which was installed on the deck above the drafting room. This tower is complete with sliding plexiglass windows, hinged door, enclosed ladder and wood seating. Windows slide on cast bronze tracks. The top track is fitted with a locking device for each

(Please turn to page 104)

Atop, left: The Robert Gray as she looked before installation of her new observation tower. Center: Workman installing plexiglass window in observation tower. Right: The Robert Gray in her new coat of paint with her new observation tower virtually complete. At bottom, left: Sandblasting the hull on the Robert Gray. Center: Thermit welding new section of skeg for rudder, which was enlarged to give better steering control. Right: Stern section showing new skeg extension and enlarged rudder in place.

Running Lights

Edited by B. H. BOYNTON

At left: Ed Beck and Stan Perry.

Center: Violet and Bill Beck, the hosts of the barbecue at Beck's Ranch; Bob Lewis and Ralph Foster.

At right: Mr. and Mrs. John Clerico.

MARITIME CARAVAN MOVES NORTH FOR BARBECUE

A goodly crew of San Francisco Bay merchant mariners, largely the shoreside variety, pointed their compasses on Sunday, September 28, up highway 101, through the famous vineyards of Napa Valley to a port-of-call a couple of points abaft Calistoga, namely Beck's Ranch.

Host to the friendly caravan were Bill Beck, Dahl-Beck Electric Company, and his gracious first mate Violet. An all-day barbecue and field day lured prominent ship operating officials, port engineers, marine superintendents and other mariners and from second-breakfast time until well into the twilight hour these hearties, their wives and families, enjoyed the many features which had been planned for their relaxation, good fellowship and plain everyday FUN!

Captain Bill personally greeted his scores of friends and so genuine was the Beck welcome that every man-Jack, and lady-Jill, immediately signed on for the voyage and from then on it was "full and bye!"

An ornate bar complete with genu-wine cuspidors did a land office business. Here Ed Beck dis-

At top, left: Mel LaRue and Lee Curran. At top, right: Bert Markovits, Mrs. E. LeFevre, Adrienne Ritchie, Bill Burnham, Mrs. Fred Ritchie, Mrs. B. Markovits and E. LeFevre. Below, left: Mrs. O. H. Smith, Dorothy Morgan, Hazel McCann, Berk Hanley and O. H. Smith. Below, right: Barbecue lineup served by Chefs Mel Schmidt and Joe Gisler.

At top, left: Philip Thearle, H. Barbierri, J. Thearle. Across the table, left to right: Mrs. H. Barbierri and Mrs. Philip Thearle. At right: Joe Granville, Dick Papps, James Frickie, Audrey Fitzgerald and Dick DeBerry. Below, left: Mr. and Mrs. Norman Backman of American President Lines. Below, center: Mel Schmidt, ranch foreman, and Eugene Sullivan. Below: right: Harold Wrigley, Ed Perkins and Joe Granville.

pensed with a lavish hand any beverage from a snappy sarsparilla to a triple-decked horse's neck.

The honors for the epicurean coup d'etat went to Chef Joe Gisler, who barbecues a mean beef. Joe labored early and late in this department and the "critters" he served up tasted like we were back on the old ship again!

Ross Marble kept the big party properly coordinated and acted as master of the festivities and prize disbursement. By the way, one of the early prizes was won by Nancy, the charming daughter of Captain "Bull" Lion.

Distinguished guests included: Damon and Matt Trout, Marine Electric Co., Portland, who flew down from Oregon for the event and swooped up brother Captain Vance Trout, somewhere in transit.

Among the prominent guests who came aboard your reporter noted: Fred Ritchie, Dick DeBerry, Mrs. E. LeFevre, all of American Hawaiian Steamship Company; G.H.Hoxie and Henry Price of American President Lines; W. C. Blake, Philip and A. Hart of Army Transport Service; M. C. Wright, Ed Perkins and Joe Granville of Deconhil Shipping Company; Ed Senter of Grace Lines; Jack Bolts and Charles Bird of Luckenbach Steamship Company; Captain Dickover and Perry Roach of Pacific Atlantic Steamship Company; S. W. Simon, Berk Hanley, Captain R. E. Barrera, Captain Lion, R. Scheuer, M. Tyhurst, W. Steward, H. A. Steiner and O. H. Smith of Pacific Far East Lines; B. Jordan and H. E. Pennebaker of Pacific Tankers; G. Solley, Pacific Transport Lines; Ed Harms, John Clerico and E. Erickson of Pope & Talbot; E. V. Sullivan, Isthmian Lines; Al Safholm and Dewey Paine of Coastwise Lines; Louis Deppman of Sudden & Christenson; H. C. Ruff of Tidewater Associated Oil Company; Captain Bob Skinner of U. S. Lines; Bill Gaugh of Parry Navigation Co.; P. Patton of Waterman Steamship Co.; Henry Barbierri of U. S. Coast Guard; Gus Janson and Andy Ells of U. S. Maritime Commission; Art Rossette and Captain Vance Trout of General Ship Service; Bob Murphy of Bay Engineering Co.; Damon and Matt Trout of Marine Electric Co., of Portland, Oregon; Al Engle of Triple-A Machine Shop; Harry Sirgo, Jr., and George Peterson of Todd Shipyards Corp.; Harold Wrigley of International Marine Paint Co., Dick Papps of Bethlehem Steel Company; William Schonig of American Bureau of Shipping; L. T. Flagg and Joe (the cook) Gisler of Jos. Gisler Company; Mel LaRue and G. H. Williams of United Engineering Company; Jim Frickie, a marine surveyor; Bob Strieff and J. L. Buckner, chief engineers; R. A. Thain, Jack Flindall, and Tom Anderson of General Engineering & Drydock Company.

Isherwood to Make Alaska Survey

Felix W. Isherwood, executive of Williams Dimond & Co. of San Francisco has been loaned to the Maritime Commission on a contract basis to make a complete investigation of port conditions in Alaska. His inquiry, which will take about six weeks, will cover conditions affecting dockage, wharfage, warehousing, lighterage, stevedoring and other port services. The investigation is being undertaken by the Maritime Commission at the request of the House Merchant Marine Committee.

Left to right: Mansfield W. Garratt, president of Garratt-Callahan Company of California; Frederick P. Teall, director of sales; and Mansfield W. Garratt, Jr.

NEW FUEL OIL CONDITIONER FROM "HOUSE OF MAGIC"

A new, concentrated chemical liquid for conditioning marine, industrial and diesel fuel oil has just been introduced by Garratt-Callahan Company of California, manufacturers of the famous "House of Magic" products. This newest addition to a well-known line of industrial chemicals is called "Liquid Flo-rite" and represents another forward step in the application of chemical science to industrial operations.

An outstanding feature of the new product is its dual action: first by conditioning the fuel oil before combustion and second by its cleaning action on heating surfaces after combustion. "Liquid Flo-rite" before combustion acts to inhibit the oxidation of heavy hydrocarbons, emulsify water with fuel oil and dissolve sludge. These impurities are thus consumed as the oil is burned, eliminating deposits of sludge and scale which reduce efficiency and increase maintenance costs. In addition, this new chemical lowers the viscosity of the fuel oil and reduces the required preheating temperature. Thus, pumping and atomizing is facilitated, burner tips are kept clean, and a more uniform efficient flame results. In the second stage of this dual action "Liquid Flo-rite" by its conditioning action of the fuel oil assumes complete atomization, eliminating carbon scale, soot and slag from the heating surfaces, firebox walls, flues and stack. This action assures maximum heat transfer, less frequent cleaning and long life of equipment.

The introduction of this new product marks the beginning of an aggressive program by which the company will continue and expand the distribution of its products throughout the Western States, Western Canada, and the Orient. In preparation for this program, Mansfield W. Garratt, president, recently commenced a reorganization of the sales and service organizations, and appointed Frederick P. Teall, director of sales. Mr. Teall, a sales executive of wide experience, has already organized a staff of qualified, experienced engineers to provide expert technical advice and service in San Francisco, Seattle, Los Angeles, and other key distribution points. Edward Bus has been appointed sales engineer in charge of marine sales in the San Francisco area. Further additions to the staff are in progress by which the firm will reestablish and improve the technical service it has rendered to clients for over 40 years.

Garratt-Callahan Company was founded in 1904 by Edward C. Garratt and John Callahan to manufacture and distribute a boiler preservative which was a pioneer in the selective, scientific application of chemistry to efficient boiler operation. It achieved rapid and wide acceptance despite the long-established use of orthodox "boiler compounds". The speed and thoroughness of its action in stationary, marine and locomotive installations inspired the use of the word "Magic", the trade name by which it is so favorably known in the United States and many foreign countries.

The same scientific but practical approach to other industrial operation and maintenance problems resulted in the development and manufacture of five additional industrial chemicals which, together with the original boiler preservative, and the newest product, "Liquid Flo-rite", constitute the famous "House of Magic" line. Recently, the third generation of the Garratt family, Mansfield W. Garratt, Jr., son of the company's President, joined the firm after serving as a Lieutenant in the Air Transport Command, piloting planes "over the hump" in the India-China theatre of operations. His interests and training in the practical application of chemical science should insure the continued progress of the company in this specialized field.

SCENES OF SEPTEMBER PROPELLERS in SOUTHERN CALIFORNIA

At top, left: Lee Vermille donating to the "Slop Chest;" Herb Pickering, Max Linder on his left; Ralph Chandler and Fred Hooper, new honorary member, are on his right; seated is Alvin Allyn. Center: Captain L. L. Lishman, speaker of the day, with Allyn, who introduced the speaker. At right: Rear Admiral Albert Ware Marshall, USN, retired; Captain L. L. Lishman, speaker; Arthur Eldridge, president of the Port of Los Angeles-Long Beach Propeller Club; Alvin Allyn of Alvin Allyn Co.; and Commodore L. L. Bennett, USCG. Below, left: Joe Barry, Tubbs Cordage Co.; Captain William McGillivray, San Pedro Tow Boat Co.; Commodore Roberts, USCG; H. K. Winterer, General Electric Co.; and Al Hill. At right: Facing the camera, from left to right: Ken Huntington and Dick Park, both of Republic Supply Co.; Norman Dunnavant, Commercial News & Daily Shipping Guide; Lloyd Richards and Stanley Lashbrook, both of Sudden & Christenson.

NORTHERN AND SOUTHERN CALIFORNIA PROPELLER CLUB FUNCTIONS

At the September meeting the San Francisco Port heard the highly interesting speaker, Captain Raymond F. Farwell, USNR, (below) "world-renowned expert in the higher mathematics of navigation." Captain Farwell is the "man who wrote THE book" on Navigation, as he is the author of "Elements of Navigation," "Handbook for Alaska Pilots," "Rules of the Nautical Road," "Comparative Rules of the Road," and numerous articles on marine collision law.

◄

Captain A. F. Pillsbury of Pillsbury and Martignoni, and Andrew Baxter, president, Federal Marine Paint Co.

Below, left: Owen Niemann, assistant operating manager, Ed Harms, operating manager, and Gerald A. Dundon, vice president and general manager, all of Pope & Talbot; Almon Roth; and Carl McDowell, assistant to the executive vice president, Steamship Division of Pope & Talbot.

▼

Below: Joseph J. Geary, with Captain R. F. Farwell, USNR.

George W. Codrington Presented Certificate of Merit

George W. Codrington, vice president of the General Motors Corporation and general manager of the firm's Cleveland Diesel Engine Division was presented the President's Certificate of Merit for his outstanding service in directing the production of diesel engine equipment used by Navy ships and submarines during the war.

Secretary of the Navy John L. Sullivan made the presentation at a ceremony in the Navy Department.

More than 90 per cent of the one billion dollars worth of Government contracts handled by the Cleveland Diesel Engine Division of the General Motors Corporation during the war years were for Navy production. In addition to its more than 300 Navy engine contracts, the Division entered into a subcontracting program involving more than 450 subcontractors in order to meet the Navy's shipbuilding time schedule, and shipped more than 14,500 engines from 1941 to 1945.

Codrington also established at his plant one of the first service schools for the armed forces to be associated with private industry. The school, which trained Navy personnel in the use of diesel equipment graduated more than 11,000 men.

At left is George W. Codrington, vice president of General Motors Corporation and general manager of Cleveland Diesel Engine Division of General Motors Corporation, being honored by the Honorable John L. Sullivan, Secretary of the Navy.

Enterprise Elects New President

According to a recent announcement, William E. Butts, a director for the past several years, has been elected president of Enterprise Engine and Foundry Co., to succeed Charles Hoehn, Sr., who retires from 30 years direction of the company's activities in the Diesel Engine, Oil Burner and Food Processing Machinery fields. In addition to his responsibilities as head of Enterprise's extensive operations, Mr. Butts will retain his present capacity as vice president of General Metals Corporation, which position he has held for over 10 years. Widely known throughout industrial circles, Mr. Butts has been recognized for his many contributions to manufacturing industries. Mr. Hoehn, Sr., will remain on the board of directors and serve in a special consulting capacity.

William E. Butts, president of Enterprise Engine & Foundry Co.

New Appointment for Pacific Tankers

Called home from port engineer duties on the Gulf Coast, George W. Miller has taken over the position of superintending engineer for Pacific Tankers, held until September 1, by Chester McKay. McKay has gone to New York.

Miller has been with the company for the past three years as a port engineer (at San Pedro the first year, and the Gulf and the East Coast since). He came to Pacific Tankers directly from the key wartime post of Principal Machinery Inspector for the U. S. Maritime Commission at Swan Island and Oregon Shipbuilding Corp. Prior to that he sailed as chief engineer for "most Pacific Coast lines," with long tours with States Steamship Co., and American Mail Line.

George W. Miller

Commodore Russell M. Ihrig

New Helmsman at California Maritime Academy

At a meeting of the Board of Governors in October, Commodore Russell M. Ihrig, USN, retired, was nominated to be superintendent of the California Maritime Academy commencing November 1, 1947, upon the retirement of Captain Claude B. Mayo, USN, retired.

Commodore Ihrig, born in Utah, was appointed to the U. S. Naval Academy at Annapolis in 1915, having won his appointment by competitive examination. He graduated from the Academy in 1918, the course having been temporarily reduced to three years because of the war. He saw service in European waters in a transport and a destroyer. He served in destroyers in all capacies continuously until 1924 and was commended by the Secretary of the Navy as Executive and Fire Control Officer of the *USS Hull,* which won the Battle Efficiency pennant, in 1923.

In 1936 he became navigator of the Asiatic Fleet flagship, *USS Augusta*, a heavy cruiser, and later made Fleet Operations Officer.

As the United States declared war on Japan, he took command of the Navy's newest high-speed fleet tanker, *USS Cimarron,* equipped with a modern destroyer gun battery, the only tanker so fitted out. The *Cimarron* joined the Task Force and following the raid on Wake Island in October, 1943, he was ordered to the staff of Admiral Nimitz at Pearl Harbor, where he first organized and established the office of Joint Shipping Control, for which he was officially commended and then became head of the Petroleum Division of the Logistics Staff.

His final cruise was in command of the heavy cruiser *Canberra,* then under overhaul for battle damage but the Japs surrendered before the ship was completed and could be back into action.

Commodore Ihrig's shore duties during his 29 years of active naval service have been almost entirely along lines which gave him special background experience for his duty as superintendent of California Maritime Academy. His first shore duty was in the Executive Department of the Naval Academy, during which time he was in charge of 550 midshipmen on their three months summer cruise. He was a student at the Line Officers' Postgraduate School, Annapolis, and after completing the one year course was assigned to the instruction staff in strategy and tactics, navigation and cryptanalysis. In 1934-36 he was Associate Professor of Naval Science and Tactics at the University of California in Berkeley, during which period he was in charge of ROTC unit on its two annual battleship cruises of one-month each to Hawaii.

The Commodore has written numerous articles for the Naval Institute Proceedings and gave numerous professional lectures before civic bodies in the Bay Area while at the University of California. California has been his official home for the last 27 years.

The Bibb's Part in Sky Queen Rescue

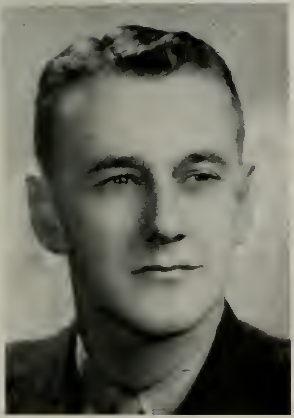
Captain Paul B. Cronk, USCG, skipper of the Cutter Bibb, is well known to Pacific Marine Review readers. During the war he was Captain of the Port of San Francisco 1945.

Several weeks ago newspapers headlined the greatest sea-air rescue in our times, the crash-landing in the North Atlantic of the American-International Airways *Bermuda Sky Queen* and the rescue of the 69 passengers and crew by the Coast Guard cutter *Bibb,* skippered by Captain Paul B. Cronk, USCG, who, with his heroic crew, effected a clean sweep rescue, bringing all aboard to safety.

When the *Bermuda Sky Queen* took off from Foynes, Eire, for Baltimore, Md., she carried 62 passengers and 7 crew members—overcrowded at best. After she had been airborne for 18 hours and 32 minutes on a flight scheduled for 17 hours, headwinds and gasoline shortage had erased all chances of her reaching her first stop at Argentia, Newfoundland. The plane's captain, Charles Martin, ex-U. S. Navy pilot, decided while he still had gasoline for almost three hours' flight, that he would double back to the U. S. Coast Guard cutter Bibb, which was on station as a weather ship some 900 miles northeast of Newfoundland. He found her, and safely landed the *Sky Queen* against gale-driven waves some 35 feet high and 100 feet from crest to crest.

Hovering near the *Bibb*, and ramming her in the rough seas, rescue work had to be delayed for seven hours. Then, as the plane began to leak, Cronk sent a message to the Captain of the plane to ask for volunteers. Three of the nine merchant mariners aboard the plane responded. They launched a rubber raft from the plane and made the original contact with the *Bibb.* Then

(Please turn to page 91)



Giles C. Stedman, now vice president of United States Lines.

John A. Barthrop, general manager of United States Lines' Pacific operations.

U. S. Lines West Coast Executive Appointments

Rear Admiral Giles C. Stedman, USNR, vice president of United States Lines Operations, Inc., and one of the nation's best known merchant marine figures, has been appointed vice president of all U. S. Lines' Pacific operations, with headquarters in San Francisco, it was announced by John M. Franklin, president of United States Lines.

At the same time, General Franklin announced appointment of John A. Barthrop as general manager of the Company's Pacific operations including the Pacific Coast of the United States Lines.

In his new position, Admiral Stedman will direct operations of U. S. Lines' Atlantic Coast-Pacific subsidiary, American Pioneer Line, and the West Coast activities of its intercoastal service, Panama Pacific Line.

Former Commodore of the U. S. Lines fleet, he has been in the Orient since last April establishing the company's offices in China and the Philippines, with headquarters in Manila.

Except for a tour of active duty with the Navy, Admiral Stedman has been with U. S. Lines continuously since 1922, and during the 25 years has become an outstanding figure among American shipmasters. During the war years he rendered distinguished service in the Navy, both at sea, as executive officer of the U.S.S. West Point, and during four years at Kings Point, N. Y. In the latter post he was in charge of the planning, organization and administration of the United States Merchant Marine Academy, and as commandant and superintendent guided its development from a blueprint to a nationally-recognized institution.

He is well-known on the Pacific Coast, having commanded the *America* on two voyages to San Francisco and Los Angeles before the war.

Mr. Barthrop, a native of Washington, was with the McCormick Steamship Company at Seattle before the war and is well known in shipping circles. During the war he attained the rank of colonel and served as superintendent of the Water Division of Seattle Port of Embarkation and later as commanding officer of the Port of Manila. He is a graduate of the University of Washington.

He was appointed assistant Pacific Coast general manager of U. S. Lines last June, and prior to that he was Pacific Coast freight traffic manager.

Both men will make their headquarters in the new U. S. Lines offices at 141 Battery Street, San Francisco.

Cooper-Bessemer Elevates Gehres and Boyer

Cooper Bessemer Corporation of Mount Vernon, Ohio and Grove City, Pa. announced the elevation of H. A. Gehres and Ralph L. Boyer recently.

Mr. Gehres has been named executive vice president by the Cooper-Bessemer Board of Directors and Mr. Boyer's new title is vice president and chief engineer.

Within the last three years, the company's engineering division, under the direction of these two men, has come forward with a number of major developments in the engine and compressor-building field.

At top: A. Gehres, executive vice president and director of engineering of The Cooper-Bessemer Corporation.

Ralph L. Boyer, vice president and chief engineer of The Cooper-Bessemer Corporation.

Left to right: C. F. McMahan, chemical supervisor, International Cementers, Inc. Frank D. Smith, California Division manager, International Cementers, Inc.

International Cementers, Inc., Appointees

C. F. McMahan, now chemical supervisor for International Cementers, Inc., in southern California has had intensive technical training and vast experience necessary to handle a large organization of specialists familiar with all phases of chemical cleaning. He was formerly with Dowell Inc. For five years he was a field engineer with I.C.I. before becoming Chemical Supervisor two years ago.

Frank D. Smith, California division manager for all I.C.I. chemical services, has the difficult job of coordinating the company's activities in marine cleaning, industrial cleaning, oil well acidizing, plastic plugging and oil well electric pilot service, as well as the oil well cementing work for which I.C.I. was created.

The firm offers a specially trained staff for marine chemical service along with industrial chemical cleaning. A fine line of equipment, consisting of pump trucks and tank trailers transport the specially compounded solvents for each individual cleaning operation for dockside service.

Charles E. Lowe Appointment

H. B. Hotchkiss has been appointed general manager of the Charles E. Lowe Company, 1850 Steuart Street, San Francisco, providing marine and industrial equipment and engineering service.

Hotchkiss has had a wide experience in the marine field. Before joining the Lowe firm he was connected with the Columbia Machine Works at its Pier 20 operations. Prior to that, he was with the Kaiser Shipyard organization for some six years, as marine superintendent and chief trial engineer at Yard 3. Previous to joining the Kaiser organization he was employed by the Matson Navigation Company for some ten years as marine engineer.

New Philadelphia Location for Hyde Windlass Co.

Hyde Windlass Company, Bath, Maine, ship machinery, propellers and special machinery manufacturers, have announced new Philadelphia office location Room 607, Bulletin Building, Juniper & Filbert Sts., Philadelphia, Pa. with William H. Schultze in charge.

Dick Hughes Promotion with Tubbs

The appointment of Dick Hughes as San Francisco District Marine Sales and Traffic representative for the Tubbs Cordage Company was announced recently by W. I. Atherton, sales manager for this pioneer Cordage manufacturing company. In his new post Dick will be in charge of sales of cordage products to both the steamship and fishing trade.

Dick has been Northern California representative for Tubbs since 1939 except for a three and one-half year hitch in the Navy during the war. Although still in his thirties, Dick has been with the Tubbs organization for over 20 years and the experience which he has gained through service in every department of the company during these years makes him exceptionally well qualified for his new position.

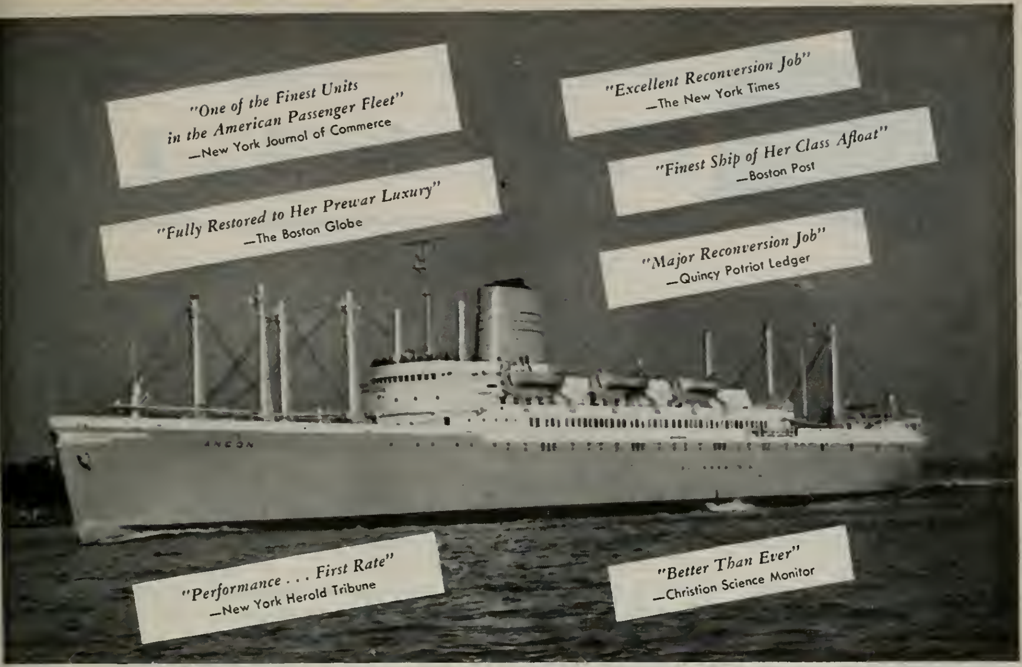
In his new post Dick will make his headquarters at the Tubbs home office at 200 Bush Street, San Francisco.

National Lead Appointment

W. C. Minsinger has been named Industrial sales manager for the Pacific Coast Branch of the National Lead Company, according to announcement by J. L. Caruth, Pacific Coast manager for the company. He succeeds K. C. Specht who has been appointed Assistant Manager of the company's Southern California division.

Since 1943, Minsinger has been associated with the National Lead Company in Portland where he is well known in local shipping circles. In this new position he will have charge of the development and distribution of the company's line of marine paints and protective coatings for the entire Pacific Coast.

W. C. Minsinger



CONVERTED BY *BETHLEHEM*

The above statements appeared after the shipping news editors of the newspapers noted inspected the Panama Line's S. S. Ancon following her reconversion from a naval auxiliary by Bethlehem's Quincy Yard.

Accomplished with speed and economy, these results reflect Bethlehem's unsurpassed combination of efficient management, skilled craftsmanship, and complete and modern facilities for all types of ship conversions, and ship repairs.

Customer satisfaction always is the keynote of the phrase *"Converted by Bethlehem."*

SHIPBUILDING . . . SHIP CONVERSIONS . . . SHIP REPAIRS
NAVAL ARCHITECTS and MARINE ENGINEERS

BETHLEHEM STEEL COMPANY
Shipbuilding Division

GENERAL OFFICES: 25 BROADWAY, NEW YORK CITY

SHIPBUILDING YARDS

QUINCY YARD
  Quincy, Mass.
STATEN ISLAND YARD
  Staten Island, N. Y.
BETHLEHEM-SPARROWS POINT SHIPYARD, INC.
  Sparrows Point, Md.
SAN FRANCISCO YARD
  San Francisco, Calif.
BETHLEHEM-ALAMEDA SHIPYARD, INC.
  Alameda, Calif.
SAN PEDRO YARD
  Terminal Island, Calif.

SHIP REPAIR YARDS

BOSTON HARBOR
  Atlantic Yard
  Simpson Yard
NEW YORK HARBOR
  Brooklyn 27th Street Yard
  Brooklyn 56th Street Yard
  Hoboken Yard
  Staten Island Yard
BALTIMORE HARBOR
  Baltimore Yard
SAN FRANCISCO HARBOR
  San Francisco Yard
  Alameda Yard
SAN PEDRO HARBOR (Port of Los Angeles)
  San Pedro Yard

NEWS FLASHES

TANKER REPAIR PROGRAM

The withdrawal, under presidential direction, of 96 or more tankers from lay-up fleets is already under way. Tankers in various stages of disrepair are being delivered to shipyards for reconditioning, with the average cost estimated at a quarter million dollars. Owned by the Maritime Commission, the tankers are being allocated to various yards by the Navy, which is footing the bill. Private companies will man and operate such of the vessels as are retained by the United States.

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NAVY PATROL VESSELS OFFERED

A limited number of Navy Patrol Vessels of the Tuna Clipper design, popularly known as the "YP", are available at a fixed price of $125,000 each. The 700-ton Navy craft are 128 feet in length, with molded beam of 29 feet and a 14-foot draft. There is capacity for 300 tons of refrigerated cargo, arrangements for stowage following the tuna clipper pattern.

The vessels, with the exception of two which are located at the Naval Base, Pearl Harbor, T. H., are located at the Naval Repair Bases, San Diego and San Pedro, California. The designation and location of available vessels may be obtained from the Maritime Commission field offices or in Washington. Application for permission to inspect should be made to the Commandant of the Naval Bases where the vessels are located.

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HAVE WE NO CRUISE SHIPS?

A press release from Cunard White Star Line on October 26 announces the Mauretania schedule for 5 cruises from New York through Caribbean ports through the Canal Zone.

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BETHLEHEM EXPANSION

Bethlehem Pacific Coast Steel Corporation's new 50-ton electric steelmaking furnace - largest and most modern of its type on the West Coast - is nearing completion at the company's Los Angeles Plant, according to an announcement by H. H. Fuller, President. It will virtually double the plant's steel-producing capacity. Mr. Fuller also stated that modern heating facilities for larger steel ingots which will be produced, have been installed, also a new 32" blooming mill. In addition, he pointed out, "construction of a new wire mill is now under way." The new wire mill is expected to be completed by the end of the first half of 1948.

The total expansion program for Bethlehem Pacific to date shows over $14,000,000 being spent in the Los Angeles area, approximately $1,000,000 in the Bay Area and about $500,000 at the company's Seattle Plant.

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UNITED ENGINEERING BUYS TURNER MACHINERY COMPANY

Purchase of the Turner Machinery Company of San Francisco, manufacturers of band sawing equipment, by United Engineering Company was announced jointly by Commodore L. F. Small, president of United and W. B. Turner, president of the Machinery company.

United will continue production and sales of Turner machines and distribution of other machinery lines represented by Turner.

CLINTON CONSTRUCTION CO. IS LOW BIDDER ON MISSION ROCK TERMINAL, SAN FRANCISCO

Clinton Construction Co. is the lowest bidder for substructure work on Mission Rock terminal, offering to do the job for $2,367,500.

Engineers of the Board of State Harbor Commissioners have recommended that the Harbor Commission accept the bid.

Harbor Commission engineers estimate that the total cost of the terminal will be nearly $5,500,000.

* * * * *

MARTIN & TURNER COMPANY TAKES ON PITTSBURGH PLATE GLASS

Martin & Turner Company of San Francisco has been appointed marine finishes representative of the Pittsburgh Plate Glass Company in the San Francisco and Wilmington areas, it was announced by W. J. Timberman, Jr., director of marine and aircraft sales for the Pittsburgh firm.

* * * * *

NORTHERN CALIFORNIA INDUSTRIAL EXPANSION

Nine months' developments for 1947 summarize as follows:

Northern California		Bay Region	
264 expansions	$ 61,600,000	212 expansions	$ 58,221,500
385 new plants	51,486,025	307 new plants	37,453,900
649 projects	$113,086,025	519 projects	$ 95,675,400

San Francisco		
69 expansions	$ 10,391,200	2,305 new jobs
83 new plants	2,444,500	601 new jobs
152 projects	$ 12,835,700	2,906 new jobs

Included in the above figures are the following, of special interest to the Maritime industry:

Ed Heuck Company, S. E. corner of Beach and Jones Streets, San Francisco, erecting new $360,000 - 65,000 square foot meat-processing plant (purveyers to ships).

Paraffine Companies, Inc., Emeryville, complete construction of modern research laboratories, as part of multi-million dollar expansion program.

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MORE SHIPYARDS TO BE HELD IN RESERVE STATUS

It is understood that the Navy's plans to hold in stand-by "reserve" 37 surplus wartime shipyards have been expanded so that the number of yards in reserve is now 60. This will mean an increase of 200% over prewar capacity.

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THE PRESIDENT'S ADVISORY COMMITTEE REPORT IS READY

The committee set up by President Truman to prepare a layman's report on the Maritime industry has completed its work, and the report will be in his hands by the time this is read. Whether the contents are disclosed to the public in advance of submission to Congress is not known. It can be stated that new ships are called for by the report. (The committee: A. T. Kellar, Marion B. Folsom, Andrew W. Robertson, James B. Black, Vice Admiral Edward L. Cochrane).

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NAVAL ARCHITECTS CONVENTION

The Society of Naval Architects and Marine Engineers will hold its annual convention in New York, November 12-15, with a big banquet on Friday evening, the 14th.

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LUCKENBACH RESUMES INTER-COASTAL

The inter-coastal service of the Luckenbach Steamship Company, which was suspended on account of labor difficulties, has been resumed.

INDUSTRIAL DEVELOPMENT IN SOUTHERN CALIFORNIA

During the month of September, 17 new factories were established in Los Angeles County with a total investment of $31,230,000, and creating 1,903 new jobs for factory workers. Thirty-four exexisting plants were expanded½ calling for an additional investment of $1,618,500, and creating 438 new industrial jobs.

Total investment in the 51 new and expanded units was $32,848,500 creating a total of 2,341 new jobs.

For the year to date, 169 new factories were established with a total investment of $67,204,000, and creating 6,712 new jobs; 303 existing plants were expanded, calling for an additional investment of $36,532,500, and creating 10,361 new industrial jobs.

Total investment for the year to date in the 472 new and expanded units was $103,736,500, creating a total of 17,074 new jobs.

Included in the above figures are:

Columbia Steel Company has announced plants for constructing a cold reduction sheet steel mill in the Los Angeles area. It is anticipated that this plant will cover 150 to 200 acres, cost $30,000,000 and employ about 1,500.

Pacific Can Company, headquarters in San Francisco, will construct a tin can manufacturing plant at 4200 E. 26th St., in the Bandini district. Building will contain about 52,500 sq. ft., and will cost in the neighborhood of $500,000.

Savage Boat Works, 8616 S. San Pedro St., is constructing a building to be used for offices and display. Company makes light-weight boats for fishing and hunting.

U. S. Rubber Company has purchased 640 acres of land near Lancaster for national tire testing headquarters.

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WEST COAST SHIPYARDS BUSY

There is so much work available on the Pacific Coast, that certain shipyards are renting idle pier space for the "storage" of vessels until there is room in their yards for the completion of the job.

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ONE WEST COAST YARD'S CURRENT SCHEDULE

Vessel	Owners or Agents	Remarks
SS MOBILUBE	Gen. Petroleum Corp.	Repair & Conversion
USAT DAVID C. SHANKS	U. S. Army Trans. Corps	Conversion
MV ALGORAB	Pillsbury & Martignoni	Conversion & Engine Repair
USAT FRED C. AINSWORTH	U. S. Army Trans. Corps	Conversion
SS W. H. BERG	Standard Oil Co.	Drydock & Voyage Repair
MV SILVERGUAVA	Kerr S. S. Co.	Main Engine Repairs
SS MISSION SOLEDAD	U. S. M. C.	Recommission
SS NORWICH VICTORY	American Hawaiian SS Co.	Rudder Damage
SS PECOS	Pacific Tankers	Tank Cleaning
SS STILLWATER	Pacific Tankers	Tank Cleaning
SS GEN. W. F. HASE	U. S. Army Trans. Corps	Feed Water Heater
SS SPARROWS POINT	Richfield Oil Co.	Collision Damage Repairs
SS ESCAMBIA	U. S. M. C.	General Repairs

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PRESIDENT CLEVELAND ALMOST READY

The American President Lines' President Cleveland will be completed in December. Trials will be held first week of December with delivery scheduled for about the 15th.

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SUCCESS OF MARSHALL PLAN DEPENDS ON AMERICAN SHIPS

If the Marshall Plan goes into effect, all American Company-owned ships will be required, and it is expected that an extension of the emergency powers of the Maritime Commission for chartering to American citizens will have to be extended.

Left: The Anchorage
tory of the Amer
President Lines disc
ing copra by means
Port of Oakland m
diesel powered
blowers and hopp

Right: A 15-ton
bronze propeller fr
C-2 freighter g
aboard Pope & Ta
Coastal Cadet. The
215 lb. piece of
ment was fabricate
Oakland for the
Steamship Compa
Portland.

PORT OF OAKLAND EXPANDS

WITH POPULATION AND INDUSTRY increasing by leaps and bounds on the mainland side of San Francisco Bay since the end of the war, the Port of Oakland, one of the leading ports on the Pacific Coast, is the maritime outlet for one of the fastest growing industrial areas in the United States.

Preliminary figures compiled by Government sources for the first postwar year of 1946 indicate that Oakland harbor handled approximately one-fifth of all waterbourne commerce in the San Francisco Bay area, an increase of approximately 40 per cent over the average amount of shipping handled from 1936 to 1941.

The Port of Oakland is ideally situated to serve this expanded commerce and shipping. It is the terminus of three transcontinental railroads, and the transcontinental and coastal highway systems which radiate to all parts of the Pacific Coast and the Western States. In its tributary territories are the agricultural, industrial, and commercial regions of north, central, and south central California, including the great San Joaquin, Sacramento, and Santa Clara Valleys. Through it also passes much of the trade for Nevada, Utah, and the other States of America's great western plateau country.

Operated and maintained by the City of Oakland, acting through its Board of Port Commissioners, the Port of Oakland also serves its sister cities of Berkeley, Alameda, Emeryville, Piedmont, Albany, El Cerrito, Hayward, San Leandro, and the communities of Southern Alameda County, which have experienced a phenomenal growth in population and industry since the war. The present membership of the Board of Port Commissioners comprises Claire V. Goodwin, president; Clifford D. Allen and Stanley A. Burgraff, vice presidents, and Dudley W. Frost and James F. Galliano, commissioners. A. H. Abel is port manager and chief engineer.

Unlike many other ports, the Port of Oakland has ample area in which to expand its present modern and extensive facilities, and a Master Plan which will fill any demands which may be placed upon it in the future. Leading maritime authorities have pointed to it as the eventual maritime center for the entire San Francisco Bay area and all of Northern California.

Oakland Board of Port Commissioners and members of the administrative staff.
Seated, left to right: Commissioner James F. Galliano, Commissioner Dudley W. Frost, President Claire V. Goodwin, and Vice Presidents Clifford D. Allen and Stanley A. Burgraff.
Standing, left to irght: Walter Breen, Chief Port Accountant; Lloyd B. Hughes, assistant port manager in charge of operations; A. H. Abel, port manager and chief engineer; and W. Reginal Jones, port attorney.

The Port area is roughly divided into the Outer, Middle, and Inner harbor sections.

The Outer Harbor, the section directly facing the Golden Gate and lying between the Oakland approach to the great San Francisco-Oakland Bay Bridge and the Southern Pacific pier, is the location of the big Oakland Army Base, the operating center of the San Francisco Port of Embarkation, and the Port of Oakland's Outer Harbor Terminals, which were operated by the Army during the war, but which are being gradually returned to civilian trade and commerce. The Seventh Street and Fourteenth Street units of these Outer Harbor Terminals are modern steel and concrete terminal buildings, as well as wharves and piers capable of handling all types of ocean-going vessels in the coastal, intercoastal, and foreign trade. In this area also is an oil pier, the large plant of the Albers Milling Company, and the establishments of the General Petroleum Corporation, the Texas Company, Rosenberg Brothers, Libby, McNeill, and Libby, American Brake Shoe Company, National Container Corporation, Western Vegetable Oil Company, the Oakland Bean Cleaning Company, and others.

The Middle Harbor, located between the Southern Pacific Pier and the mouth of the Oakland estuary, is now the location of the $100,000,000 Oakland Naval Supply Center, one of the largest Naval supply facilities of its kind in the world. The Navy selected the site because of its ideal situation for any needs of peace and war, and the land on which it stands was largely contributed by the Board of Port Commissioners and the City of Oakland to the Federal Government for this purpose.

The Inner Harbor is an estuary nine miles in length (approximately five miles of which is 800 to 1000 feet wide), separating the cities of Oakland and Alameda, and along which the Port of Oakland and private interests have many valuable harbor facilities, including on the Oakland shoreline the shipyards of the Moore Dry Dock Company, Howard Terminals, the Port of Oakland's Grove Street Terminal at the foot of Grove Street, Ninth Avenue Terminal at the foot of Ninth Avenue, and the Inland Waterways Terminal at the foot of Webster street; the grain elevator and grain shipping facilities of the Ralston-Purina Company, and many other harbor installations.

The Port of Oakland's Grove Street Terminal comprises the Grove Street, Market Street, and Clay Street Piers, and quay wall areas with a combined berthing space of 3613 linear feet and transit shed area of 249,820 square feet. Oakland's wholesale and warehouse district, a great many manufacturing, industrial, and commercial concerns, and the downtown business district are within a short distance.

The Port's Ninth Avenue Terminal, which is located on Brooklyn Basin in the Estuary, is also in close proximity to the business district, Lake Merritt, and the central residential district. It is in the center of highly industrialized area of manufacturing and allied concerns, and like all the other terminals, has full rail and water facilities. This terminal provides berthing space of 2278 linear feet, transit shed area of 91,000 square feet, and open pier area of 320,220 square feet. It also includes

(Please turn to page 94)

Top: The Port of Oakland's Grove Street Pier on the inner harbor along the Oakland Estuary.

Center: The Port of Oakland's Ninth Avenue Terminal with Lake Merritt, and the Oakland business district in the background.

Bottom: The Port of Oakland's extremely valuable Outer Harbor area, on the mainland side of San Francisco Bay, facing the Golden Gate. The approach to the San Francisco-Oakland Bay Bridge is seen on the left, the Oakland Army Base, the Port of Oakland's Outer Harbor Terminals, and in the right foreground the Albers Milling plant and the approach to the Southern Pacific pier.

Rules of the Nautical Road

(Continued from page 68)

stated in the other rules but which the mariner is required to observe under Article 29:

1. The keeping of a proper lookout.
2. Anchoring in a proper anchorage, not in a fairway.
3. Veering chain when at anchor, if necessary to avoid collision.
4. Keeping a proper anchor watch.
5. Making certain that the vessel is properly manned and steered.
6. Keeping a proper log.
7. Going at a slow speed when moving near piers where damage may be done by her swell.
8. The using of a flare up light or detonating signal to attract attention, if necessary.
9. Informing the Master immediately of any unusual developments.
10. Carrying ballast in a light ship, so that she may be handled well.

Pilot Rule 312.2

"Steam vessels are forbidden to use what has become technically known among pilots as 'cross signals', that is, answering one whistle with two, and answering two whistles with one."

Note: This pilot rule was for many years held invalid by the Courts. In 1940, however, the Supreme Court reversed a long line of lower Court decisions, and the rule was held valid. The proper procedure, in the event of one vessel blowing an improper signal, is for the other vessel to answer with the danger signal, stop, back if necessary and exchange signals again, not proceeding until signals have been agreed upon. It has become quite common in some harbors for much smaller vessels to either give way or agree to improper passing signals when in a situation with a much larger vessel. Especially is this true in the case of harbor tugs meeting ocean-going vessels. For example, a tug is approaching an ocean liner on a crossing situation course, with the tug being privileged. If the liner were to blow a 2 blast signal, interpreted to mean, "I intend to hold course and speed across your bow," there would be several answering signals the tug could blow:

(1) A I blast signal, meaning "I refuse to grant you permission to cross my bow and am holding on to my rights by maintaining course and speed," is illegal under the pilot rule above. The tug may be held at fault if a collision results from her stubbornness in holding on.

(2) A 2 blast signal, agreeing to the maneuver proposed by the liner, places the entire situation under the rule of special circumstances, and therefore *both* vessels are burdened. This means that the tug relinquishes her rights as a privileged vessel.

(3) A 4 blast signal, followed by stopping her engines, backing if necessary (blowing a 3 blast signal if she does so), and not proceeding until the proper signals have been exchanged. This is the correct procedure for the tug to follow.

None of the above courses of action are likely to appeal to the navigator who wishes to proceed on his way without delay, maintaining his rights and yet following the rules of the road. The obvious conclusion, there-

(Continued on next page)

fore, is that the smartest thing a privileged vessel can do is *get her 1 blast signal blown first.*

Pilot Rule 312.3 (Paragraph 1)

"The signals for passing, by the blowing of the whistle, shall be given and answered by pilots, in compliance with the rules in this part, not only when meeting "head and head," or nearly so, but at all times when the steam vessels are in sight of each other, when passing or meeting at a distance within half a mile of each other, and whether passing to the starboard or port."

NOTE: The sound signals for Inland waters are called "Passing Signals," because the one and two blast signals must be exchanged and agreed upon before two steam vessels can pass each other in any situation. Although pilot rule 312.3 indicate the 1 and 2 blast signals as being, under some conditions, course change signals, numerous Court decisions, refuse to establish this meaning. Therefore the meaning of the 1-or-2-blast signal in Inland waters has no positive connection with the actual course of the vessel. Any connection between a one blast signal and a change of course to starboard, or between a two blast signal and a change of course to port is merely a matter of coincidence. Passing signals are changed between steam vessels under the following circumstances:

(1) The vessels must be within sight of each other. This means that passing signals are not exchanged in fog or other periods of low visibility unless the vessels can actually see each other.

(2) Whenever passing within a distance of one half a mile. This does not mean that vessels must wait until they are one half a mile apart before exchanging signals; it only means that vessels can never pass that close to each other *without* exchanging signals.

(3) In sufficient time to avoid collision.

These passing signals are exchanged between steam vessels only. It is not necessary for a steam vessel to use the one or two blast signals when maneuvering to avoid a sailing vessel in Inland waters. The 3 blast signal has been interpreted as having the same meaning as it does under the International rules; that is, three short blasts should also be sounded by any vessel having sternway upon her to indicate that fact to an approaching vessel. It is of course blown only when vessels are in sight of one another. The 4 blast signal, or "Danger Signal" as it is called, is an Inland waters signal only, and has no legal meaning on the high seas. This signal, unlike the other whistle signals, may be used in fog. A common saying among seamen in "Whenever in doubt, blow the danger signal."

BOOK REVIEW

THE MODERN GAS TURBINE, SECOND (1947) EDITION, including JET PROPULSION; by R. Tom Sawyer, engineer, Diesel Equipment, American Locomotive Company; published by Prentice-Hall, Inc. Price $4.00; 224 pages; 6¼″ x 9¼″.

This valuable book, which brings together a tremendous wealth of useful information on the modern gas turbine and its varied uses as a supercharger and prime mover, including revised and the latest data on jet propulsion, is probably the most important contribution to the literature in the field in recent years.

The Maintenance and Repair of Army Vessels

(Continued from page 41)

spection & Survey, Planning, and Procurement Division.

5. It will be the responsibility of the assigned planner to arrive at a price agreement with the contractor at the earliest possible time, to avoid delay in closing out the contract within a reasonable time after the vessel leaves the contractor's yard. When the contract is completed by the shipyard, the planner will assemble the field orders into an addition to the basic specifications. The cost and expenditure group will fill out Form 1801 giving the Contracting Officer a breakdown price of each item. A copy is forwarded to OCT, Attention: Water Transport Service, Maintenance and Repair Branch.

6. The leading inspector and his team of inspectors, together with such specialist inspectors as may be necessary, will be responsible for seeing that all work accomplished by a contractor, is done in accordance with Army specifications and is done in a practical and workmanlike manner in accordance with the best marine engineering practice.

7. As soon as a repair job is completed it will be the duty of the leading inspector, in conjunction with other members of his team, to prepare a written completion report showing the status of all items in the basic specification, and field orders.

All repair costs are analyzed for each vessel for each voyage and are compared on a basis of cost per mile steamed. Repair costs on vessels in different classes are compared on a basis of 1000 horsepower per mile. This provides a means for comparison between the different vessels in each class and between the various classes of vessels operated by the Army.

The following repair costs are based on the operation of all vessels since they were acquired by the Army:

Class	Total Cost/Mi	Total 1000 HP/Mi	Engine Mile	Boilers Mile	Auxiliarys Mile
P2 T.E.	68.6c	3.3c	11.6c	24.2c	32.7c
P2 G.T.	52.4c	3.0c	6.7c	14.1c	31.6c
C4	62.9c	6.9c	5.1c	14.0c	43.7c
C-1	70.4c	17.6c	5.9c	17.4c	47.0c

Conversions

In addition to accomplishing the normal voyage repair work, the vessel Engineering Branch prepares plans and specifications for the conversion of Army vessels from one class to another and for purposes of modernization and compliance with Coast Guard safety-at-sea regulations. The Inspection Section is responsible for the inspection of this conversion work to assure compliance with specification of plans.

One member of the Planning Section carries the responsibility for repairs and maintenance on all small craft, harbor tugs and ferry boats together with the issuance of job orders to the Marine Repair Shops.

Certain qualified specialists under the direction of the Superintending Marine Engineer are continually carrying on experimental work to determine the application and economy of many commercial products, such as fuel oil treatment, refractory coatings for boilers, fuel and lubricating oil analyses, and engineering materials in general.

The Superintending Marine Engineer has four "assistants to the Superintending Engineer" whose duties consist of interviewing all applicants for positions in the engine departments of Army vessels to determine their experience and capabilities with a view to obtaining the services of thoroughly experienced, sober and reliable personnel. These assistants also personally visit all vessels in port, interview the engineering staff and discuss their operating problems. Where operating difficulties are experienced and solutions can be found, directives are prepared and issued to all other vessels of the same class in the fleet, advising the Chief Engineer of the trouble, and the remedy, thus helping him to avoid similar troubles.

Economic Considerations of Pacific Coast —North Atlantic Cargo Trades

(Continued from page 34)

should be limited since the loss of cargo cubic due to pallets may amount to 12 per cent. Another solution to stowing packaged cargo in the wings would be to use portable conveyors with ramps.

In order to decrease the loading time, a light metal, portable dunnage should be designed. This should be of a collapsible type that could be erected easily.

Cargo claims are excessive due to pilferage, paper box crating, and glass breakage. The use of large containers, of a collapsible metal construction, should be used for higher value cargo. These containers will decrease cargo claims, and minimize dock checking and the number of shipping marks.

Panama Canal tolls per ton of cargo can be decreased by "fitting the vessel" to the Panama Canal Rules. That is to say, the Panama net tonnage could be less for a modified C-3 vessel.

Any study of economical water transportation must include an investigation into pier facilities. Many New York piers were designed for horse-drawn vehicles, for example. An investigation into pier improvements is now being made. Modern developments in ships can only be carried to a certain stage, whereupon the piers must be refitted to work in conjunction with those ships. Many solutions have been proposed and it is imperative that the steamship companies meet the challenge of survival. They are today faced with a problem that can only be solved by ardent planning of their ships and pier facilities.

BOOK REVIEW

THE SHIP'S MEDICINE CHEST AND FIRST AID AT SEA.

This edition, which has been revised by the United States Public Health Service and the War Shipping Administration, is published for the information and guidance of the master and other licensed and certificated crew members who may be directly or indirectly responsible for the administration of emergency treatment at sea on vessels which do not carry a physician. In this volume are described in simple non-technical language the diseases and medical emergencies most commonly encountered at sea, the symptoms by which they are determined, directions for first aid, and for follow-up of prolonged emergency treatment.

This book has been adopted by the U. S. Coast Guard and the U. S. Coast and Geodetic Survey as the official standard for use on ships and at shore stations where no medical officer is available. It has been included as a textbook in the schools and academies of the U. S. Merchant Marine Cadet Corps, the state Maritime Academies of California, Maine, Massachusetts, New York and Pennsylvania, and at U. S. Maritime Service officer candidate schools.

It is sold by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

The Bibbs Part in Sky Queen Rescue

(Continued from page 78)

the cutter laid down oil slicks, launched a 15-man raft, and maneuvered it up to the plane, loaded it and got it out to open waters, where a small boat pulled passengers aboard. Three loads were successful, but the fourth trip—with 16 aboard the raft—went badly. The raft was swamped; a motor launch which managed to get the people aboard was hit by a wave which killed its engine. Captain Cronk took the *Bibb* over to the swamped launch as the passengers were washed out of it, and seamen leaped into the water for them while others reached out from life nets over the cutter's side to haul them to safety.

During the tense night the *Sky Queen* was blown 60 miles while the *Bibb* made a lee, keeping her searchlights on the plunging plane, and waiting. There were 24 men and one woman aboard. The flying boat's hull stayed intact and in the morning, with the wind abating, the last of the passengers and crew were safely taken off. The cutter riddled the *Sky Queen* with gunfire, stood by till she burned and sank, and then turned home for Boston, arriving four days later with a broom tied to her mast, signifying a clean-sweep rescue.

United Seaman's Service Close Domestic Ports

United Seamen's Service will discontinue all domestic services by the end of the year and will proceed to operate only a small number of overseas facilities in the busiest ports of the world. Under this plan all services of the USS will be discontinued by the middle of 1948 unless adequate funds are forthcoming for its continuance.

As of the present time United Seamen's Service is operating in eight domestic ports and 20 overseas ports. Under the plan of gradual restriction of services it is planned to operate possibly 11 overseas facilities during the first half of 1948.

Lack of financial support to continue the entire existing program was given as a reason for this action. United Seamen's Service was started during the war and during the five years it has been in existence has expended a total of more than 25 million dollars. During the war its contributions from the War Fund were second only to the USO.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946

Of PACIFIC MARINE REVIEW, published monthly at San Francisco, California, for September 11, 1947, State of California, County of San Francisco.

Before me, a Notary in and for the State and county aforesaid, personally appeared B. N. DeRochie, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Pacific Marine Review and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, JAMES S. HINES PUBLISHING CO., 500 Sansome St., San Francisco 11, Calif.
Editor, T. DOUGLAS MACMULLEN, 500 Sansome St., San Francisco 11, Calif.
Business manager, B. N. DEROCHIE, 500 Sansome St., San Francisco 11, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

JAMES S. HINES, 500 Sansome St., San Francisco 11, Calif.
MARY G. HINES, 500 Sansome St., San Francisco 11, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

B. N. DEROCHIE,
Business Manager.

Sworn to and subscribed before me this 11th day of September, 1947

EDITH VIA,
(Seal) Notary Public in and for the City and County of San Francisco, State of California.
(My commission expires September 3, 1948.)

KEEP POSTED

New Equipment and Literature for Yard, Ship and Dock

At top: Palmer Shile Company heavy-duty die truck.
Below: The firm's all metal four-way pallet.

New Palmer-Shile Products For Marine Field

A new heavy duty die truck has just been announced by the Palmer-Shile Company, Detroit, Michigan. This new die truck is especially designed for high production shops and factories where heavy dies, stampings, forgings, jigs or fixtures are continually moved from one location to another. Roller conveyors can be put on the bed of the truck to facilitate materials handling. The truck in the illustration is rated at eight tons.

The new four-way, single-face, all steel pallet is constructed of special corrugated rolled steel, welded throughout for rigidity and endurance. Built with beveled edges on two sides to permit trucks to ride over easily. Special rolled channel steel face—with center brace for extra weight loads. Designed for use with power lift and hand trucks.

Chemical Cleaners For Marine Use

Sumco Products, Inc., Brooklyn, N. Y., manufacturers of chemical cleaners for industrial and marine purposes, announces that arrangements have been consummated recently for adding new sales and service agents well known in their respective territories.

On the Pacific Coast, Messrs. H. E. and David L. D. Shaw of Boiler Engineering and Supply Co., 3630 N. W. Front Avenue, Portland, will service Oregon. In Seattle and the state of Washington, Messrs. Robert and Frank McMahon of the Power Engineering Supply Co., 308 Prefontaine Building, Seattle, will handle Sumco Products, A. F. Devoto, of Harbor Supply Company will service the San Francisco bay area and Northern California. Arthur Pegg, directing the Sumco Service Agency in San Pedro, will continue to serve the area.

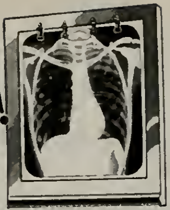
Ets-Hokin and Galvan Radio-Telephone

The Canadian Gulf Lines decided they wanted an EHG Radiotelephone on their *Powell River,* but they did not want the installation to cause any delay in their schedules. Ets-Hokin & Galvan had the answer: The power supply and cables were installed by the EH&G Wilmington shop, and the final installation, tuning, and testing was finished by the San Francisco shop. The *Powell River* thus got a fast installation without delay in her sailing dates.

Pictured is Harry B. Allen, EH&G sales representative, beside the powerful 100-watt, 10 channel unit. This radiotelephone is designed for larger ships, and on the *Powell River,* San Pedro and Seattle were loud and clear during the tests from dockside in San Francisco Bay. EHG radiotelephones are also available in 10, 25 and 65 watts.

Harry B. Allen of Ets Hokin & Galvan

Danger!



DO YOU KNOW . . . that there are approximately 250,000 "unknown cases" of tuberculosis?

. . . that TB still kills more Americans between 15 and 44 than any other disease?

. . . that the surest way to discover TB and check its spread is the chest X-ray?

. . . that your Christmas Seal money buys X-ray units and makes possible mass examination?

PLEASE, send in your contribution today.

Buy Christmas Seals

This space contributed by

FITLER
LUBRICORE

There is but one genuine "LUBRICORE" Self-Lubricating Rope made and placed on the market by FITLER, patented by FITLER and easily identified as a FITLER product by the Self-Lubricating "Green Yarn Center"

Insist on "LUBRICORE"—Beware of imitations—Don't accept substitutes. Ask for "LUBRICORE", the Self-Lubricating Green Yarn Center Pure Manila Rope made by FITLER.

The Edwin H. Fitler Co.
PHILADELPHIA, PA.
MANUFACTURERS OF QUALITY ROPE SINCE 1804

General Quick Aid Fire Guards

The General Pacific Corporation, only Western manufacturer of Underwriters' approved fire extinguishers and safety equipment, announce a name change for their line of fire equipment. The new name is General Quick Aid Fire Guards.

Five types of extinguishers are included in the Quick Aid Fire Guard line; Vaporizing liquid, carbon dioxide, foam, soda-acid, and non-freeze (Hi-Test soda acid and foam). Each is a rapid, efficient fire-fighter.

Quick Aid Fire Guards are effective for both home and industrial use, for they will extinguish fires caused by oil, gasoline, chemical, textiles, paper, grease, wood, or electrical equipment.

Directions for the use of each type extinguisher are clearly engraved and simply stated on each Quick Aid Fire Guard.

The General Pacific Corporation, an affiliate of The General Detroit Corporation, maintains offices in principal cities throughout the West.

General Quick Aid Fire Guards.

Radar Reflector

The U. S. Coast Guard has announced the development of an experimental "radar reflector" which can enable ships with radar to spot buoys at up to twice the present distance and in heavy fog. The device, designed to fit on ordinary buoys, will give a much stronger echo to radar beams and make a buoy visible to radar-equipped ships up to ten miles away.

BRICKSEAL
REFRACTORY COATING

FLINT HARD WHEN COLD

Brickseal becomes flint hard as it cools — protects walls from damage.

APPLIED LIKE PAINT—Brickseal, a combination of high fusion clays and metal oxides, protects refractories . . . preserves brickwork . . . prevents cracking, spalling and flame abrasion.

When heated, Brickseal deeply penetrates the pores and joints of the bricks and forms a highly glazed ceramic coating for refractory walls.

Brickseal is also used as a bonding material; it produces a tight brick-to-brick joint and welds the wall into one solid unit. Write for illustrated booklet; ask for a demonstration.

Brickseal is semi-plastic when hot allowing it to expand and contract with the furnace

SEMI-PLASTIC WHEN HOT

BRICKSEAL
REFRACTORY COATING
5800 S. Hoover St., Los Angeles, Calif.
1029 Clinton St., Hoboken, N. J.

Port of Oakland Expands

(*Continued from page 87*)

an adjacent area which is utilized for the handling of lumber and other bulk commodities.

Among the other Port facilities along the Inner Harbor the Inland Waterways Terminal at the foot of Webster Street has berthing space of 929 linear feet for jobbers supplying California interior and provides shippers with a means of having their products trans-shipped on ocean-going vessels. Fishermens' Pier at the foot of Franklin Street maintains a colorful dining room, in addition to a fish market, while Planters Dock at the foot of Broadway is one of the leading dining places of the region with an authentic South Sea atmosphere. Two smaller municipal piers at Livingston and Dennison Streets and the Oakland Yacht Harbor at the foot of Nineteenth Avenue are also Port facilities.

The upper, or eastern end of the Estuary is an artificial tidal canal connecting the Estuary with a natural basin, known as San Leandro Bay, which has a direct outlet to San Francisco Bay by means of the channel of the Bay Farm Island Bridge. Within this area the Board of Port Commissioners plans eventually to provide another large shipping terminal development supported by a large industrial area which is to be reclaimed within the near future.

Between the southern shore of San Leandro Bay and the waters of San Francisco Bay proper is located the Oakland Municipal Airport, also administered by the Board of Port Commissioners, which will also eventually be integrated into a sea-air-rail combination with the projected San Leandro Bay harbor development.

The Port of Oakland also has a total area of 1540 acres in the North Harbor area, north of and adjacent to the San Francisco-Oakland Bay Bridge and fronting on San Francisco Bay, on which it is eventually planned to develop a terminal which will care for the augmented commerce and foreign trade of the future by ultimately providing berthing space for 90 large vessels. The first step in this development, which will be undertaken as needs demand, will consist of dredging, construction of a unit of piers, and related facilities.

All the offshore shipping facilities constructed by the Board of Port Commissioners are of steel and concrete construction, equipped with automatic sprinklers for fire protection, which provide shippers with maximum safety for their cargo and low insurance rates. The transit sheds are provided with ample ramps so that there is free circulation within the transit sheds for trucks, thereby reducing congestion to a minimum. Railroad tracks are provided on wide aprons at shipside as well as alongside platforms in the rear of the transit sheds thereby facilitating the handling of cargo between ships and rail carriers with maximum speed and efficiency.

The Port of Oakland has available large areas of industrial property, situated near the harbor installations, or immediately adjacent to them, which are excellent for concerns and large industrial plants which depend on waterborne transportation for the movement of their products or commodities.

Copra Handling

To expedite the handling of copra and other vegetable oil bearing products, the Port has ample Sutorbilt bulk handling equipment capable of discharging bulk cargo directly from vessels into railroad cars, trucks, or bins within the transit sheds. This equipment is diesel-powered and mobile, and can be moved as complete units from one terminal facility to another so as to accommodate the needs of all Port facilities.

The Oakland Municipal Terminals are served by leading foreign, intercoastal, and coastwise lines, and are capable of caring for any and all types of cargo. Their ideal relationship to all forms of transportation makes them centers of trade and commerce destined to and from the Bay area and the Port's tributary region.

The Oakland and East Bay area itself has become generally recognized as the most favorable location for low cost distribution. For years the mainland side of San Francisco Bay has been noted for its wide variety of nearby and readily accessible sources of materials, a fact that has been recognized by industry generally throughout the Nation during and since the war. Nowhere else has industrial growth been so rapid or so stable and permanent as in the Oakland and East Bay region since V-J Day.

Centrifugal Refrigeration System

(Continued from page 55)

composed to closely-spaced blades which result in a series of throttling processes which discourage the flow of gas due to the tendency of the gas to expand in the constricted space.

Impellers are usually solidly keyed to the shaft which is designed so that the critical speed is well outside of the operating speed range. Impellers and shaft assemblies are statically and dynamically balanced to insure vibration free operation.

The number and diameter of the impellers required depend on the total compression ratio, the density of the gas, and the permissible peripheral speed of the wheel. Rotative speeds of compressors for refrigeration service vary from 3000 rpm to 8000 rpm and peripheral speeds of the impellers from 400 to 600 feet per second. Compressors are in use with 1, 2, 3 and 4 sets of impellers.

Compressors which are not designed for direct connected motor drive must be provided with seals at the point where the shaft emerges from the housing in order to prevent the outward leakage of refrigerant and the inward leakage of air and water vapor. Design details vary with the different manufacturers but the seal consists essentially of an oil film maintained between two rotating surfaces.

Centrifugal compressors for refrigeration service are force feed lubricated, being provided with an oil pump driven from the compressor shaft.

One of the advantages of centrifugal compressors is that no internal lubrication is needed since there are no rubbing parts. Therefore no oil is carried into the condenser and cooler and surface contamination of the heat transfer surface is avoided. This results in the maintenance of continued high operating efficiency. The only place at which oil is introduced into the system is at the compressor bearings so means must be provided in the bearing design to prevent the lubricating oil from flowing along the shaft and entering the gas stream. This is usually accomplished by labyrinths and slingers to throw the oil from the shaft where it is collected in pockets in the bearinigs and returned to the oil reservoir.

The condenser is of the conventional shell and tube design with water flowing through the tubes and the refrigerant contained in the shell. Because of the large gas volume circulated as compared to the size of the shell, care must be taken to distribute the gas to all parts of the condenser. The condenser must also be equipped with a non-turbulent area for the collection of air and non-condensable gases so that these gases which are removed by the purge and refrigerant recovery system contain a minimum of refrigerant vapor.

The evaporator is also of the shell and tube design with water or brine flowing through the tubes and refrigerant contained in the shell. Because of the large gas volume liberated in the evaporator the boiling action of the refrigerant is quite violent and the possibility for liquid entrainment in the gas very good. Therefore, means must be provided within the evaporator for the elimination of entrained liquid. It is also necessary to provide a

(Please turn to page 100)

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▲ San Diego Marine Agency, taken September 2, 1947.

◄ E. R. Raphael, division manager, Shell Oil Company, Los Angeles.

Shell Modernizes San Diego Marine Facilities

THE OPENING OF THE NEWLY-MODERNIZED SHELL OIL COMPANY, Incorporated, marine dock in San Diego Harbor was recently announced by E. R. Raphael, Southern California Division manager.

This dock, located at the foot of Crosby Street, just north of the U. S. Navy Destroyer Base and adjacent to the major canneries and shipyards, is in the most advantageous location in the harbor from the standpoint of convenience to the commercial fishing fleet, Mr. Raphael said.

Former facilities consisted of a wharf 286 feet long with a workable area of 102 feet in length by 24 feet in width, having an approach of 184 by 16 feet, a 40 by 20 foot float, and a small office. Dispensing equipment consisted of four diesel fuel and three gasoline meters.

Modernization of facilities included the widening of the existing dock area by 16 feet and an additional 150 by 40 feet added to the present length, giving a working area more than 5 times as large as formerly, this additional length extends the dock facilities into deeper water which allows Shell to give simultaneous service to four of the largest tuna clippers now in service.

The existing float was modernized and moved 25 feet outboard into deeper water. A combination office, package and broken-barrel storage was constructed. Restrooms and a shower were installed for the exclusive use of crew members.

To further facilitate the working arrangement, a barrel storage area was provided by adding an 8-foot strip along 100 feet of the dock approach. This accommodates 250 drums of marine lubricants.

In order to prevent the possibility of a fuel shortage during the tuna season, a 5400-barrel diesel tank was erected on tidelands property. This being a dredge-filled area, it required a pile and concrete foundation. A fire wall was added, with arrangements made for a later addition of three 5400-barrel tanks and miscellaneous storage.

New dispensing and pumping facilities having a capacity of 36,000 gallons of diesel fuel per hour have been installed which will enable Shell to fuel the largest tuna clippers in two to three hours where formerly it took ten to twelve hours to lift the same amount of fuel.

Ten three-inch meters are provided for diesel fuel in the working area of the dock. Each meter will handle 300 gallons per minute and the fuel flow, after passing through the meter, is split into two 2-inch outlets to service the vessel.

This gives a total of twenty fueling nozzles on diesel fuel. Seven meters and outlets are provided for gasoline service. Meters for gasoline, diesel fuel and water are clustered and arranged in such order that all craft tying to the dock are covered with from two to four meter outlets.

Pipe lines are laid in a trench along one side of the dock, with removable deck covers for protection while enabling ease and accessibility for painting and maintenance.

San Diego Marine Dock in 1925.

► N. E. McDermut, operation manager, Shell Oil Company, Los Angeles.

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Centrifugal Refrigeration System

(Continued from page 96)

large area for gas flow to the compressor in order to reduce pressure drop caused by friction. This usually results in an evaporator design in which the tubes occupy a relatively small portion of the cross-section area of the shell.

The pressure reducing element usually consists of two float valves. The first float valve drains the liquid from the condenser into a "flash chamber" where a portion of the liquid is evaporated with resulting sub-cooling of the remainder of the liquid. The gas generated in the "flash chamber" is led off to one of the intermediate stages of the compressor. The pressure in the flash chamber corresponds to the intermediate pressure in the compressor and consequently the sub-cooled liquid is drained from the "flash chamber" by means of a second float valve from which point it enters the evaporator.

This arrangement when compared to draining the liquid directly to the evaporator from the condenser, results in a reduction in power required of about 5½ per cent and at the same time increases the compressor capacity by about 8 per cent, when the evaporating temperature is 35 deg. F., and the condensing temperature 105 deg. F.

The purge and recovery system consists essentially of a small reciprocating compressor, a condenser and a means for separating condensed water and liquid refrigerant. The purge condenser can be cooled by air, water or refrigerant from the main system. The lower the temperature of the cooling medium available for the purge condenser the lower will be the concentration of refrigerant in the air discharge from the system.

Centrifugal refrigeration systems of large capacities occupy a minimum of floor space. For example, a 1200 ton motor driven unit occupies 250 sq. ft. of floor space and requires about 10 ft. of headroom. The system is completely vibrationless.

While we do not attempt to pose as a prophet we believe that the future will see an increasing use of centrifugal compressors for refrigeration service and that their development will follow a pattern similar to that which we have seen with the centrifugal pump and steam turbine.

New Plastic Anti-Fouling Paint

(Continued from page 47)

is no better than orthodox paints. Anti-Fouling protection of approximately 2 years has been demonstrated on panels and between 1 and 1½ years on ships. However, in order to obtain such durability proper application is required—the surface cleaned to bright steel and phosphoric acid treated, two or more coats of anti-corrosive applied, and the anti-fouling applied to over 6 mils thickness and dried for 6 to 24 hours, depending on the weather, before undocking.

Progress in anticorrosive paints will influence the prospects of the various types of antifouling coatings. If this progress results in the development of a truly effective barrier coat, then the need of thick films such as the 30 mils produced by hot plastic, would be obviated. There are two anti-corrosives under development at the present time which may fill the bill as both an anticorrosive and a barrier coating.

The first is the hot solvent anticorrosive.

It is a compromise between hot plastic and orthodox anticorrosive, and has the advantage of a thick film while eliminating some of the disadvantages of hot plastic, such as inadequate adhesion to steel when used for a primer. It will be melted at time of application and applied with the usual hot plastic equipment, and contain enough solvent to permit the matrix to penetrate through dust and orient itself at the steel surface. It has been possible to apply a hot solvent anti-corrosive paint of this type to a film thickness of 70 mils without sagging and with good adhesion.

Vinyl Resin is the basis of another promising anticorrosive. Two of the outstanding advantages of this type of matrix for use as a primer over bare steel are: one, it is relatively impervious to moisture, and two, it is compatible with phosphoric acid. It is possible to spray an emulsion of the rust inhibitor (phosphoric acid solution) and vinyl—thereby combining two operations in one.

The best solution will only be accepted after extensive service tests on ships, and every company which makes ships available for service testing is aiding progress. Innumerable new ingredients have been made available for trial in the industry, and many of these products have proved their merit in the thousands of panel tests run during the War by the Navy, and its cooperating laboratories. However, many of these have yet to survive the gauntlet of ship service tests.

As a result of research, materially better protection should be available for ship owners in the future.

World's First Gas Turbine Ship

(Continued from page 51)

the benefits of the gas turbine lie in other directions. It runs more smoothly than a gasoline motor, giving instant acceleration without requiring any preliminary warming up. There are also fewer working parts needing maintenance, less space is occupied, and engine room control is extremely simple. A further advantage is that it has better power-for-weight ratio—i.e., less weight is required for producing equivalent horsepower. This new engine thus combines the advantages of the smooth-running steam turbine with economy in weight and space.

It should not, of course, be assumed that M.T.B. 2009 is jet-propelled. The power from the jet is converted into rotary motion so as to drive a shaft and propeller of the conventional kind. Jet propulsion as such is not considered efficient for ships and craft with good sea-going qualities and capable of carrying armament.

During the war years, a great deal of work bearing on the subject of gas turbine power was carried out in Britain to make possible jet propelled aircraft; some of the components developed for this purpose have been used in the installation in M.T.B. 2009.

Britain's Admiralty is now planning larger gas turbine machinery to be installed in a vessel of the escort type. This further project has been designed as a marine propulsion unit from the start, and it is predicted that its durability and efficiency will be greater than those of the engine which has just been tested.

Shipbuilding and Ship Repair

(Continued from page 50)

Recognizing, as the Congress has, that a healthy shipbuilding industry and maritime industry is essential to the peace and national security of the country, the reason the shipbuilding industry has a problem of survival is the failure of Congress to appropriate the necessary funds to implement the Merchant Marine Act of 1936.

The only answer, it seems to me, to this problem, is a wider education of our people whose will will be expressed by their representatives in the Congress to the absolute necessity for appropriating funds in a sufficient

(Please turn to page 102)


quality


MARDEN & HAGIST

Shipbuilding and Ship Repair Industry

(Continued from page 100)

amount to give to each of those shipyards essential to our national security enough work to preserve and educate their trained technical staffs.

The Navy and the Maritime Commission have already determined those shipyards which they consider essential for national defense. It only remains then to see that such shipyards have a minimum amount of work to maintain their skills.

This country, now as before, is being penny wise and pound foolish. To keep our shipbuilding industry alive will require an annual expenditure of not in excess of $300,000,000—approximately fifteen per cent of the two billion dollars outlay for the atomic bomb which has no peacetime value other than a threat!

The public as a whole gets a maximum for its tax bill through a healthy shipbuilding industry and a Merchant Marine which can be operated as a profit.

The Corsair In Service

(Continued from page 37)

Sofa Beds and Chiffochests

The keys to the solution and design of the staterooms are the folding marine sofa bed and the chiffochest by Arnot. Simmons mattresses are the final comfort touch. The sofa bed used on the *Corsair* is a most efficient one, being a true foam rubber upholstered sofa by day and a true bed complete with innerspring mattress by night. By simply releasing a latch the sofa back drops to a horizontal position revealing a bed equipped complete with blankets, sheets and pillow ready for sleeping. It is this item of equipment that makes it possible to completely transform the staterooms from bedrooms at night to living rooms by day.

To further conserve space, add to luxury and make possible a living room-bedroom design, the designers have created a special chiffo-desk. This piece of furniture

(Please turn to page 106)

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Now ready for West Coast installation! Read these facts on the new GE Radar!

THESE SETS MAY BE PURCHASED OR RENTED

INITIAL COST

Typical units, including antenna, fittings, minimum spare parts, etc., cost about $6300. This very low cost is due to simple design, simple installation, G E facilities.

INSTALLATION

Viewing indicator and console are in one unit. This, plus the antenna, makes up the complete G E unit. Expensive connecting cable is thus eliminated, and installation is a very simple process.

OPERATION

General operation is obvious without instruction, but about 15 minutes of basic instruction on adjustment and picture interpretation is required. Thereafter, the operator's proficiency increases with actual experience.

MAINTENANCE

Service is available in all major ports; EH&G have an optional fixed-fee service plan which is lower than possible with other radars. Only 34 low-cost standard tubes are used, and power drain is no more than on an ordinary electric kitchen toaster.

DESIGN

The ELECTRONIC NAVIGATOR was designed specifically for commercial use, and has no expensive components which are primarily military. It is compact, convenient; has 2, 6, and 30 mile range scales and other practical features.

POWER

Distance is largely limited by the height of the mast; power is entirely adequate to give clear pictures at maximum range. We will be glad to demonstrate an "Electronic Navigator" Installation at your convenience.

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Bethlehem Repairs Robert Gray

(Continued from page 72)

◄ At the left: Boring hole for rudder skeg grudgeon bushing in new skeg. Place where this was thermit welded to old skeg is clearly visible.

► F. S. McGuigan, manager of Bethlehem's Alameda Rapair Yard and author of this article, graduated from the University of California in 1931 with a B.S. degree. He took post-graduate work at Stanford University in 1939 and 1940, for which he received a degree in Mechanical Engineering. In February, 1941, he joined Bethlehem as a Sales Engineer at the San Francisco Yard. Later that year he was transferred to Bethlehem's Alameda Repair Yard where he became assistant manager. He was appointed to his present position as manager of the yard in August, 1945.

sash and the bottom track fitted with stainless steel rollers and pins.

Another important item on this job was installation of a new forged steel skeg at the lower portion of the stern post. The old section was burned off at frame 1, and a new section forged, machined and thermit welded in place parallel to the base line. Size of the rudder was increased 10½″ to suit the new skeg.

Cracks in the saddle of #4 main bearing on both sides of the starboard main engine, also in the engine bed plate, and in engine "A" frame in way of #4 main bearing, were repaired by a special process. A new crankshaft was installed in the starboard engine, replacing the one which was damaged. All auxiliary engines and motors were dismantled, overhauled and reassembled.

The after mast was removed and a heavier wood mast installed in its place. This was fitted with a new boom 17 feet long complete with galvanized bands and fittings. Two small hand winches of 500 lbs. capacity, each single line pull equipped with brake and ratched panel, were installed at the mast base for topping fit.

The upper deckhouse on the boat deck connecting to pilot house was extended and provision made for a visiting officers' stateroom and drafting room.

The pair of davits on the port side of the aft house were removed and in their place a pair of boom type davits were installed. A 22-foot survey boat of plywood and oak framing was specially constructed.

While on duty in Alaska, the anchor windlass was submerged and filled with salt water when the ship collided with an ice pack, necessitating complete dismantling, cleaning and overhauling of motors, controls and machinery.

A depth recorder was installed while the ship was in drydock.

The ship was completely painted outside and inside with the new colors of the Corps of Engineers, replacing the war time gray.

Fresh water tanks and fuel oil tanks were completely cleaned.

The towing winch was removed from the aft end of the deckhouse. In its place a cast steel towing winch was installed.

Approximately 8500 linear feet of weather wood decking on main deck, boat deck and around the pilot house were caulked.

Other items included drydocking, cleaning and painting. Before the outside hull was painted it was sand blasted from keel to bulwark rails.

The *Robert Gray* passed her test run with flying colors and has now begun her new job of making hydrographic surveys along the Northern California coast.

Among the New Books

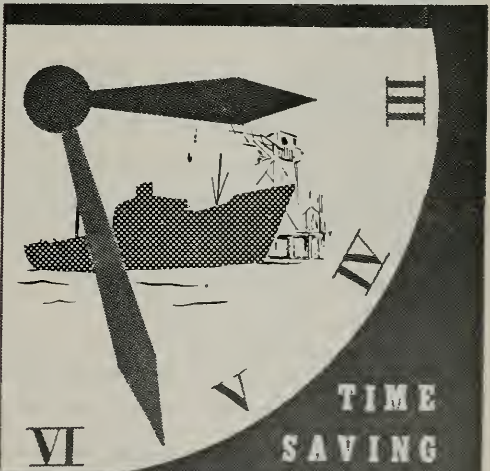
THE ROMANCE OF NICKEL published by The International Nickel Company, Inc., 6″x9″ in size, 60 pages, well illustrated with line drawings.

This informative book relates the history of nickel down through the ages, how nickel is produced, and what it is used for together with present research and predictions for its future. The uses of Nickel are many and varied in our everyday life, and the comparative recent development of nickel, especially in the mining of nickel in Canada, Celebes, Cuba, New Caledonia, Norway and Russia, and in smaller amounts in several other countries. Scientists estimate that there is about twice as much nickel in the earth's crust as there is copper, zinc and lead combined.

The important position of Canada in nickel production has been maintained by the constant effort to uncover and develop its ore bodies, to create better methods of getting that ore out of the earth and to provide economies in its smelting and refining.

The success of research in developing new and improved nickel alloys has resulted in the extensive use of nickel in the United States, in the production of materials for improved equipment requiring qualities of strength, toughness and resistance to corrosion, wear and heat, as well as other special and useful properties.

This book was printed originally in Canada in answer to the requests in that country for the story of one of its major enterprises. In view of the many applications of nickel in the United States, it was felt that an edition in this country of THE ROMANCE OF NICKEL would also be of interest.


III
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The Corsair in Service

(Continued from page 102)

which looks like a simple chest of drawers becomes a writing desk when the top drawer is pulled out and is equipped with the necessary stationery compartments, etc. A hinged flap lifts, revealing a dressing mirror and additional cosmetics compartments, to create an efficient dressing table.

To Visit Alaska and Mexico

During the summer months the *Corsair* will travel from Vancouver, British Columbia on an 8-day trip cruise to Alaska. These Alaska summer cruises will be through the calm protected water of the Alaska inland waterways and fjords, with stops at Ketchikan, Juneau, Skagway and Sitka. The winter cruise will start at Long Beach, California, and the *Corsair* will sail through the sparkling tropical waters of the Californian and Mexican coast to glamorous Acapulco, the Riviera of the Americas. Luxury will be the keynote of both the summer and winter cruise. Pacific Cruise Lines have been unrestrained in their intentions to offer not only the best in accommodations and itinerary, but also the very best in cuisine and service.

V-2000 - A New Ship Type

(Continued from page 39)

fed with steam of 600 psi gage and 840° F. total temperature at the throttle. The design will be such that the turbine will operate continuously when delivering 13,750 shp at about 95 rpm of the propeller shaft.

The main turbine will consist of one high pressure turbine and one low pressure turbine, each connected through a flexible coupling to a suitable pinion meshing into the first gear of the double reduction gear. An astern element capable of delivering 80 per cent of ahead torque at 50 per cent of the full speed ahead propeller revolutions.

Two steam boilers will be installed in the engine room. These will be of the vertically fired, oil burning, two drum, water tube type and will be fired by steam atomizing wide range burners. An air preheater will be installed in the uptake of each boiler. Each of these boilers will have approximately 8100 square feet of water heating surface and at normal rating will generate 53,500 lbs. of steam per hour at 625 psi and 850° F. total temperature with feed water at 375° F. Each boiler will be capable of sustained operation while generating 80,000 lbs. of steam at these same pressure and temperature conditions. At its normal rating the standard efficiency of each boiler will be at least 88 per cent.

Forced draft system of operation will be used with pneumatic type automatic combustion control. Stack velocities will be accelerated by additional air supply to soot remover controls.

Three 600 kw turbo-electric generators will be installed to take care of power requirements for electric deck machinery, engine room auxiliaries, refrigeration plants, ventilating fan motors, galley service, and ship's lighting. The main low pressure turbine will be mounted on an exhaust directly into the main condenser and the auxiliary turbines will exhaust into one auxiliary condenser. Condensate from both condensers will be pumped through the standard closed system of feed water heating, picking up heat from the inter- and after-condensers of the air ejector, the first stage heater, the gland drains, the second stage heater, and the deaerating heater which acts as an enclosed hot well providing a positive head on the feed pump, and so to the boiler drum.

Make-up feed for the boilers and potable and sanitary fresh water make-up supply are assured by two large distillers each of 30,000 gallons per day capacity.

It is anticipated that fuel consumption of this plant will be not more than 0.575 lbs. per shp hour for all purposes, based on oil of 18,500 btu per pound. This power plant at normal output is figured to give the ship an easy sea service speed of 19 knots. Her reserve power will enable her to make 20 knots or more whenever necessary.

Refrigeration

The total refrigeration connected power load is 260 kw for cargo, ship stores and air conditioning. This may be compared to a total connected load of 870 kw when underway at sea. All the auiliaries are electrically operated including: sanitary service pumps; fuel oil transfer pumps; circulating pumps; condensate pumps; main feed pumps; bilge pumps; fire pumps; cargo oil pumps; refrigeration machinery; ranges, coffee urns, broilers and bake ovens; laundry machinery; cargo winches; windlass and capstans; steering gear; ventilating fans; forced draft fans; and machine tools. The main switchboard in the engine room will distribute power for all these services to control boards covering certain blocks of motors.

Summary

A complete intermediate class cargo and passenger liner with a good turn of speed, this hull is proportioned to produce a sea-kindly vessel well calculated to deliver a comfortable and enjoyable sea voyage. Every care has been exercised to assure a healthy variety in the cuisine and to achieve artistic pleasing interior decorative effects.

Lurline Will Soon be Ready

(Continued from page 43)

capacity for producing 40,000 gallons of water per day keep the fresh water tanks pressed up tight. A complete new chlorinating system including hypo-chlorinator units, retention tank, pumps, and necessary piping keeps this water supply in condition to fulfill all the requirements of the U. S. Public Health Service. It is anticipated that this feature will prove to be of advantage not only in providing ample supplies of potable water but also in maintaining a smoother riding ship in comparison with the former large tanks gradually emptying as the voyage progresses.

Propulsion Machinery

All of the machinery in the engine rooms was completely reconditioned. Main turbines were removed from the ship, sent to maker's shops, and the rotors and cylinders rebladed where necessary. Rotors were balanced, valves adjusted, and the entire turbine made like new. Condensers were retubed and repacked. All pumps were overhauled, thoroughly cleaned and repacked. All steam piping and valves inspected, gaskets renewed, piping and valves re-insulated. Thousands of new blades were installed in the 18 turbine rotors of the three ships. Inspection of the 12 boilers on the *Lurline* revealed a number of tubes needing renewal, particularly in the superheaters. Brickwork in the furnaces was completely renewed. New lube oil purifiers were installed in the engine room. The electric generating sets were overhauled, cleaned and parts renewed where necessary.

When the *Lurline* goes into service, she should perform like a new ship and she will be greatly improved in the appearance of her profile by the elimination of the well deck forward.

New President for C. J. Hendry Co.

Leland D. Adams, Jr., new president of C J. Hendry Company.

The Board of Directors of the C. J. Hendry Co. announce the election of Leland D. Adams, Jr., as president of that corporation. This appointment fills the vacancy left by the resignation of C. J. Dilke. Mr. Dilke will continue to serve on the Board of Directors and in an advisory capacity for the company.

L. H. Moulton, D. T. Buist Named Turco Sales Chiefs

Appointment of L. H. Moulton to the post of national sales director and D. T. Buist, assistant national sales director, was announced recently by S. G. Thornbury, president Turco Products, Inc. Their headquarters will be the firm's main office in Los Angeles.

These appointments mark another step in the growth of this concern which manufactures several hundred specialized cleaning and processing compounds for the marine and 21 other industries here and abroad. During the past two decades Turco has established four factories in Los Angeles, Houston, and Chicago. Selling direct to the industrial consumer Turco maintains sixty-five warehouses and sales offices staffed with trained technical service men.

Fifteen years' experience in the selling of Turco's broad chemical line gives Lou Moulton excellent qualifications to direct the nationwide sales-service staff. A graduate of Colorado College of Agriculture, Mr. Moulton was well known in the dairy and allied industries for many years joining Turco in 1931. For the past eight years he has directed Turco's Eastern Division from the Chicago plant office.

Dan Buist, assistant national sales director joined Turco in 1936 as a specialist with 20 years' experience in the automotive field. Transferred to the Aviation Division in 1939, he was promoted to district sales manager in 1943, and Western Zone sales manager in 1944.

Left to right: Lou Moulton, national sales director and D. T. Buist, assistant national sales director of Turco Products, Inc.

Wickert of Swett Co.

H. J. "Hank" Wickert, service engineer of the George E. Swett & Co., Engineers, recently returned to San Francisco from an extended trip east where he visited various eastern principals whose lines are handled by the Swett company.

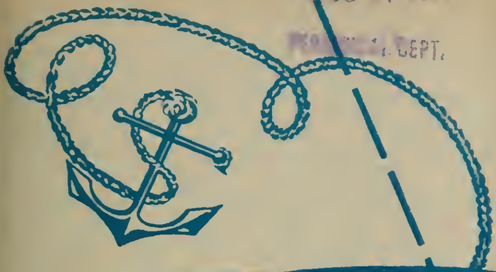
The Warren Steam Pump Co., Inc., Warren, Mass.; Davis Engineering Corp., Elizabeth, N. J.; Carrier-Brunswick International Inc., Syracuse, N. Y. and the Ilg Electric Ventilating Co., Chicago, Ill., were among the plants that Wickert reports are working on a big backlog of orders, regardless of the so-called slowing down of the shipbuilding industry.

After spending a week in the office of the Swett company, Wickert left by plane for Seattle, Wash., to confer with the Markey-Cunningham Co., another of Swett's prominent manufacturers and who makes steam and electric cargo winches, along with deck machinery.

Airco Announces New Welding Apparatus Carrying Case

The new Airco Apparatus Carrying Case with the lift-off tray exposed.

The Air Reduction Sales Company recently announced the availability of an improved carrying case for transporting a welding or cutting outfit right to the job in an orderly and compact manner. Torch, tips, regulators, hose, gloves, goggles, wrenches and miscellaneous equipment can all be compactly arranged in this new case. The carrying case has a net weight of 10½ pounds. Its dimensions are 22 inches long, 8 inches wide and 9 inches deep. The case retails for only $5.90 each and may be secured by writing Department 1558P, Air Reduction Sales Company, 60 East 42nd Street, New York 17, N. Y., or the Airco sales office nearest you.



Pacific MARINE REVIEW

DECEMBER, 1947

S. L. Hanson, Master Mechanic in the Seattle mill and an employee of Tubbs Cordage Company since 1905 checks a spinning jenny for accurate delivery of yarn.

Another salute to our Northwest Mills in Seattle — and to the "old timers" as well as the "new timers" who keep the name Tubbs foremost in the field of fine rope.

It requires, of course, superior fiber and highly specialized machines to produce good rope. But it also requires men with "know how" — men whose skill and pride in their work are reflected in every coil of finished product.

In both the San Francisco and Seattle mills of the Tubbs Cordage Company, men of this calibre—many descendants of the original rope makers of the Tubbs mills of nearly a century ago — daily check and recheck each stage of production to assure a rope product that is worthy of the Tubbs trademark.

Specify this famous Extra Superior Manila trademark for a rope that offers extra value and service.

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EXTRA SUPERIOR MANILA
CORDAGE COMPANY

TUBBS CORDAGE COMPANY

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Pacific MARINE REVIEW

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LOS ANGELES OFFICE . . . . . . 816 West 5th Street, Zone 13. Telephone Michigan 3129

"TOPPER" TAKES A TRIP ...on Columbian!

IT'S a long way from the Philippines to the top of a tall Douglas fir in Washington.

Starting in the land of the finest Manila, in the heart of the best fibre-producing provinces, Columbian's resident buyers secure the pick of the fibre crop.

Then it is shipped to Auburn, N. Y. There it is processed by the most modern methods, in the best equipped mill in the world. The result is COLUMBIAN TAPE-MARKED PURE MANILA ROPE, the best rope modern science can produce.

Look for the red, white and blue surface markers—your assurance of absolute dependability.

There is no finer rope!

COLUMBIAN ROPE COMPANY
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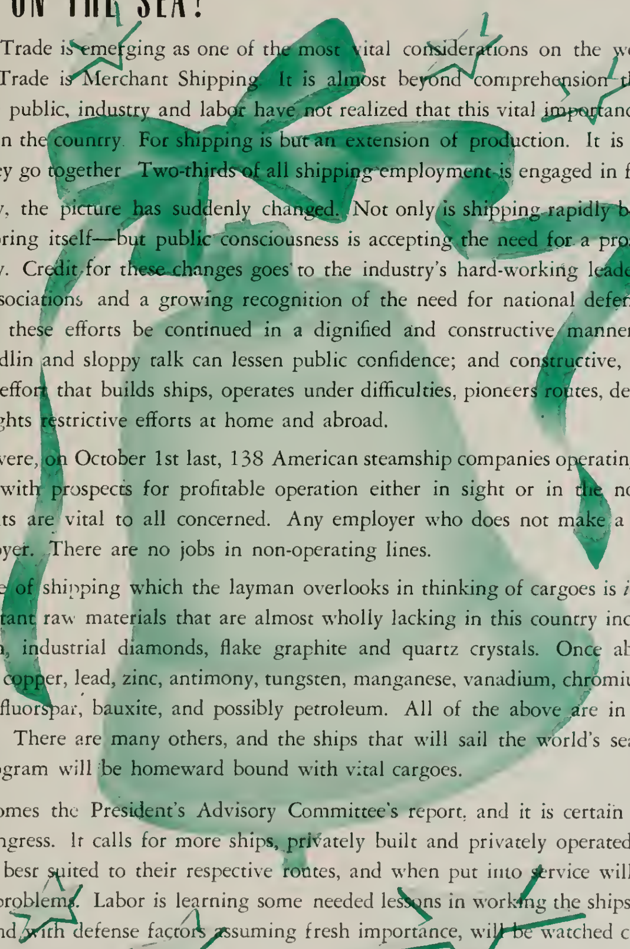
Pacific MARINE REVIEW

BRIGHT ON THE SEA!



World Trade is emerging as one of the most vital considerations on the world scene—and World Trade is Merchant Shipping. It is almost beyond comprehension that the government, the public, industry and labor have not realized that this vital importance is personal to everyone in the country. For shipping is but an extension of production. It is part of production. They go together. Two-thirds of all shipping employment is engaged in foreign trade.

Happily, the picture has suddenly changed. Not only is shipping rapidly being restored—or is restoring itself—but public consciousness is accepting the need for a prosperous shipping industry. Credit for these changes goes to the industry's hard-working leaders, the press and trade associations and a growing recognition of the need for national defense. It is important that these efforts be continued in a dignified and constructive manner. Dignified, because maudlin and sloppy talk can lessen public confidence; and constructive, because it is constructive effort that builds ships, operates under difficulties, pioneers routes, develops world trade, and fights restrictive efforts at home and abroad.

There were, on October 1st last, 138 American steamship companies operating some 2170 vessels, and with prospects for profitable operation either in sight or in the not-too-distant future. Profits are vital to all concerned. Any employer who does not make a profit is not a safe employer. There are no jobs in non-operating lines.

A phase of shipping which the layman overlooks in thinking of cargoes is *imports.* The list of important raw materials that are almost wholly lacking in this country includes nickel, tin, platinum, industrial diamonds, flake graphite and quartz crystals. Once abundant, but depleted, are copper, lead, zinc, antimony, tungsten, manganese, vanadium, chromium, mercury, gold, silver, fluorspar, bauxite, and possibly petroleum. All of the above are in the mineral classification. There are many others, and the ships that will sail the world's seas under the Marshall program will be homeward bound with vital cargoes.

Now comes the President's Advisory Committee's report, and it is certain to get some action in Congress. It calls for more ships, privately built and privately operated. They will be the types best suited to their respective routes, and when put into service will solve some competitive problems. Labor is learning some needed lessons in working the ships both ashore and afloat, and with defense factors assuming fresh importance, will be watched closely. Shipyards are busy with conversions and repairs, and may soon be active in new construction.

There are able leaders in this industry. They should assume increasing stature as the industry clinches its vital place in the nation's life.

Report of the President's Advisory Committee On the Merchant Marine

American Export Lines' proposed new cargo-and-passenger vessel for the Mediterranean route. This 21,000-ton, 675 passenger vessel is the type listed in the tabular chart. Almost coincident with the release of the Committee's report, American Export Lines announced plans for proceeding with construction of two of these.

The anxiously awaited report of the President's Advisory Committee on the Merchant Marine was handed to the President during November, and is being widely approved by the industry. Important excerpts are quoted herewith.—EDITOR.

The Committee concluded that the best prospect for a strong progressive merchant marine would be realized in one that is privately owned and privately operated on a remunerative basis in commercial services, receiving assistance from the Government to the extent necessary to put it on a fair competitive basis in its various foreign-trade routes, and to protect it from discriminatory practices in domestic trade. Such a policy must balance the freedom of action, initiative, and incentive required by private enterprise to develop its commercial services and build up business in a highly competitive field, against the regulation necessary to insure that public funds expended are used in the public interest. The Committee recognizes that charter operation of Government-owned ships is justified when conditions under which particular services must be carried on preclude private ownership.

At the present time the United States possesses about 45 per cent of the total world tonnage of oceangoing ships. The greater part of this United States tonnage is represented by ships of emergency types, built to fulfill the most urgent wartime needs and not well suited for highly competitive commercial operation. Fortunately, even during the war, the program for constructing high-quality cargo ships and tankers was continued, so that there are at present available standard high-quality ships in sufficient number to meet most of the requirements of our offshore dry cargo and of our tanker trades. On the other hand, few of the war-built vessels are well adapted to our coastwise domestic trade and there is also a grave shortage in our merchant fleet of passenger-carrying vessels. Because of present pressing demands for overseas transportation, war-built troopships, with almost primitive passenger accommodations, are transporting Americans and other nationals under conditions which can be justified and permitted only because no more suitable ships are available. These ships not only fail to meet the standards of safety at sea prescribed by the United States Coast Guard regulations, but in some cases fall short of meeting the requirements established by the International Convention of Safety of Life at Sea.

While some American-flag operations have been carried on successfully without aid from the Government, high standards, established by legislation and by public policy, have put American ship operators at a substantial disadvantage with foreign competitors—a disadvantage that has not been offset by operating economies or other improvements.

In foreign trade the American merchant marine is in competition with a not inconsiderable amount of foreign-flag shipping that benefits from varying degrees of Governmental assistance. The provision in the 1936 act for countervailing subsidies is designed to meet any specifically discriminatory practices by foreign governments and appears adequate for this purpose if invoked when necessary.

The Committee has found that, while foreign shipyards are heavily engaged in constructing modern and efficient ships that will soon be competing with ours for world trade, the American shipbuilding industry is rapidly approaching almost complete inactivity. Except for one large seagoing hopper dredge ordered by the United States Army Engineers in July 1947, and four small cargo ships for Argentina, existing contracts for the construction of vessels in American shipyards will have been completed by early 1948. Unless new contracts are placed in the immediate future, the American shipbuilding industry will suffer such a loss in its technical and engineering staffs and in its skilled labor personnel that years will be required to restore it to a basis of substantial and effective operation.

Historically since 1865 and up to the 1936 act, American commercial fleets have operated under difficulties which at times virtually removed the American flag from the seas. Progress of Government assistance have been initiated and tried at intervals, but all of them have failed to accomplish the objective of maintaining an adequate merchant marine.

The recommendations of this report seek to provide means of avoiding further repetitions of these periodic break-downs. The fact that this Nation poured more than two and one-half billions into building merchant ships in World War I, and a total of 12 billions for the same purpose in World War II, should be evidence enough that the country cannot abandon shipbuilding or ship operation in time of peace. *Shipbuilding skills and the know-how of ship operation are essential national assets and must be preserved.*

(1) *Reorganization of the Martime Commission.*—A prerequisite to the re-establishment and maintenance of effective shipping and shipbuilding industries, which require some degree of governmental regulation and a measure of governmental aid, is vigorous administration of the functions now entrusted to the Maritime Commission.

This Committee is convinced that there is no assurance of such administration under the existing statutory structure of the Commission. As long as the great variety and volume of activities now carried by that Agency continue to demand attention and occupy the time of the members of the Commission, it is unlikely that ship operators can obtain the prompt decisive action required by the industry.

It is strongly and primarily recommended, therefore, that the Maritime Commission be reorganized into,—

(*a*) A Maritime Administration under a single Administrator, who, in time of peace, should report to the Secretary of Commerce and who should be charged with the executive and operative functions presently assigned to the Maritime Commission; and

(*b*) A Maritime Board composed of the five Commissioners set up in the 1936 act, in whom would be vested the quasi-legislative and the quasi-judicial functions for which the Maritime Commission is now responsible.

The executive assigned to direct the Administration should rank as an Under Secretary in the Department and should have access to the President and Cabinet through the Secretary of Commerce so as to keep maritime activities in working relationship with other Government departments whose interests are affected by or bear upon shipping and shipbuilding programs.

The duties of the Maritime Administrator would require that his office be, in fact, the liaison of the shipping industry with the various governmental agencies, almost all of which have responsibilities or authority which bear in some measure upon shipping.

Removal of the operating functions from the Commission should permit that body as reconstituted to concentrate its energies and attention on the policy-making responsibilities in the quasi-legislative and quasi-judicial sphere normally assigned to a commission.

(2) *Construction Financing.*—Uncertainty as to national maritime policy has been one of the important factors deterring investments in maritime ventures. The Committee believes that given prospect of fair and reasonable remuneration and assurance of consistency of

(Please turn to page 98)

The Cleveland Trials Will be Featured

Resplendent in her white and pearly gray paint, punctuated by the gleaming red and blue of her stacks, *President Cleveland,* 23,507-ton trans-Pacific luxury liner made an informal debut to the Bay Area when she went on drydock at Bethlehem Steel Company, San Francisco Yard early Monday morning, November 24, prior to her sea trials and delivery to her operators, American President Lines.

The *President Cleveland* and her sister ship, the *President Wilson,* now being outfitted at Bethlehem-Alameda Shipyard, Inc., are the only two passenger vessels of their size being built in the United States today, besides being the largest liners ever built on the Pacific Coast.

The *Cleveland* was towed from her outfitting dock at Bethlehem-Alameda and docked on the San Francisco Yard's largest floating drydock. Here her underwater body was cleaned and given four coats of paint, her draft figures repainted, her propellers cleaned and buffed, and her sea valves inspected. Among other work performed, stern gland packings were removed and the vessel's four Peloruses set.

After coming off drydock on November 28, the *Cleveland* was inclined by means of an elaborate system of tracks and weights in order that her center of gravity might be accurately determined.

Sea trials for the vessel will be held the week of December 8, followed by delivery the week of December 15. The Pacific Marine Review will be well represented at the trials, and an important part of the January issue will be devoted to the ship.

COAL-OIL CONVERSION

(While this article is based on conversion operations in the Todd yards, the points made and the statistics given are representative of the industry as a whole.—Editor.)

FORTY-SIX YEARS AGO the steamship *Arab* completed a history-making voyage across the Pacific. She was the first vessel to burn oil, instead of coal, under her boilers.

Within a short time oil-burning proved to have a number of advantages over coal: an appreciable saving of dead weight and space, because of the smaller amount of oil that had to be carried as against coal, which increased cargo capacity; smoother operation, giving continuous speed at peak capacity; lower operating costs; cleaner conditions in the boilerroom and easier maintenance, because of there being no corroded boiler protection plates, floor plates, and angles, and less deterioration on the bunker surfaces, cleanliness and time-saving in bunkering; lack of smoke, soot, or ashes on decks of passengers ships; and, but by no means least, it has taken away the hard, laborious existence which is, and always has been, the heritage of the fire-room staff on a coal-burning vessel.

Thus, fuel oil soon became the monarch of the seas, pushing coal into a subordinate position after over a century of supremacy. Gradually, a vast number of vessels already powered by coal, were converted to oil-burning. A large percentage of new ships were equipped with oil burners from the start. Today, whatever American construction there is, is all oil-burner or Diesel, while even foreign construction leans heavily towards oil-burning equipment.

By the time World War II came along, the ratio was about 30 oil burners and 25 Diesels against 45 coal-burners in the world's merchant fleet, predominantly foreign. At this writing, the ratio has doubled in the oil-burning division while the coal-burners have been cut exactly in half. And at the rate of present conversions from coal to oil, it seems probable that within a few years, less than 1/10th of the world's 77,000,000 tons of ships will be powered by coal.

The ARAB (later the M.S. Dollar) the first vessel to be converted from coal to oil.

Within the past year, all of Todd's shipyards have experienced considerable activity in coal-oil conversions, naturaly enough since they have been leaders in the manufacture of oil-burning equipment for over 35 years. Within the past six months alone, the Brooklyn and Hoboken Divisions converted two Dutch freighters, four Canadian tankers of the Imperial Oil "Park" fleet, three pre-war Greek cargo vessels, and a number of other ships of foreign construction. In addition, Todd has shipped out hundreds of units to shipyards and ship operators all over the world for conversions elsewhere. Indications are that the trend in coal-oil conversion, will continue for some time. For, despite the fact that only about 22% of the world's merchant tonnage in use today still burns coal, this represents hundreds of vesels and as the coal crisis in Europe worsens, the demand to change over increases.

Wartime ship construction added considerably to the number of coal-burners. There were, for example, 60 Todd-built British Liberties of the "Ocean" type equipped with Scotch type Howden forced draft coal-burning boilers; 200 Canadian-built "Ocean" types, similarly outfitted; 43 Scandinavian smaller class cargo vessels, of about 4700 tons each, and 93 U. S. built N3's, 2700-ton coal-burning cargo carriers.

These vessels were built to be fired by coal for foreign operators to conserve the world's oil supplies for the needs of war, and because coal bunkering facilities were more accessible overseas than oil-fueling stations.

Now, a large percentage of these vessels are to be reconverted for fuel oil, because of the world shortage of coal, but in such a manner as to be readily reconverted back to coal should the situation demand it.

The coal situation in England and on the continent is so grave that the British government has repeatedly reduced allocations of coal for stocks at bunkering depots abroad, and at the same time reduced the amount of coal which may be taken on by vessels in England.

There are troubles in the petroleum field, too—shortage of tankers, need for more and larger pipe lines, strikes in affiliated industries, and high costs, but they are more than offset by the crisis in coal. So we can look forward to continued activity in coal-oil conversion.

When converting a ship from coal to oil, a number of factors have to be considered before a plan is drawn—the number of her furnaces, type of equipment, horsepower of engines, available space for oil tanks and normal run, to allow for reserves. Today, about 80% of the conversions are from three-boiler Scotch type Howden forced draft systems, with three or four furnaces in each boiler. Therefore, we'll dwell chiefly on the problems met in such conversions.

Actually there are a number of different types of oil burners, varying in size and according to the type of air draft: natural, assisted, induced, and forced. Todd makes special registers for all types of air draft, and also a special furnace front, forced-draft type for the Howden Scotch boiler conversions. This special type utilizes the existing coal-firing apertures, and renders the system readily convertible back to coal.

Once it has been decided what kind of oil-burning equipment is to be installed, by Todd combustion experts and ship operator's engineers, it is then necessary for them to determine the status of existing tanks and bunker spaces to see how much of it can be adapted to the new system.

It is generally the practice to consider first tanks in the double-bottom for oil storage, to relieve as much of the former coal bunker space for cargo stowage. Where this is found practical, it is often necessary to make a cofferdam separating the feed-water storage tank from the ballast tank which will now contain the oil. This is to prevent the oil from seeping into the feed water, and vice-versa, water mixing with the oil. It may be decided that the cofferdam is not required if the tank adjoining the oil space carries ballast water, but it is necessary, nevertheless, to see that all rivets are caulked and the section oil tight, reinforcing by welding, if necessary.

When the engineering drawings are being made up to show the location of the oil-firing system and its parts —storage tanks, pump, oil heaters, and strainers—consideration must be given to the service on which the vessel will normally operate to provide enough storage space for the maximum amount of reserve fuel. Ordinarily, a coal-burning ship which is going to maintain the same service after being converted, will require about 65% of the space for oil reserves as for coal bunkers. Since many conversions take place, however, after new owners buy vessels and change their services, there have been many variations in these percentages. For example, a coastwise vessel burning coal might use up less space for reserve fuel than the same ship intended for a run to South Africa and return.

When a ship actually enters a shipyard for conversion, these engineering details have all been carefully worked out and plans drawn up, so it is usually a routine problem to follow through from there. However, it has often been found that where it is intended to utilize double bottom tanks, and convert other sections of the area near the boilers for fuel storage, the steel plates and beams may be corroded or damaged, requiring strengthening or replacement.

All things being normal, however, the physical steps in the conversion are, in a general way, as follows:

1. Remove all coal from the bunkers, and where the conversion is to be permanently oil-burning, all coal handling equipment, such as saddle-backs for sliding coal into the bunkers, and in some cases, trolley systems used for conveying the coal to the boiler-room area. Any openings caused by such removals must be blanked up.

2. Scale the interiors of the coal storage spaces to remove any accumulation of dirt, rust, etc., using pneumatic hammers for the process. The area that is not to be used for oil storage should be coated with paint or other rust-preventive material.

3. Remove all defective plating and beams. blank up or renew according to needs.

4. Build oil tanks of the correct size, as determined by the factors discussed previously, utilizing existing bulkheads or frames where possible or install new sections, all in accordance with classification rules and requirements.

5. The storage tanks usually include one settling tank near the boilerroom which carries about one day's supply of oil, two or three main storage tanks (deep tanks) and two or more of the double bottom or ballast tanks, the capacity of which depends upon the amount of oil it is desired to carry, and the available space.

6. Pumps must also be considered. The usual set-up is one transfer pump, for the transferring of oil from the storage tanks to the settling tank, and two service pumps, one in use and one stand-by, used for pumping oil under pressure from the settling tank to the oil burners. Two (2) oil heaters and two (2) duplex strainers have to be installed; the former to heat the oil to the required temperature to obtain a viscosity of 150 S.S.U. in order to give good atomization of the oil as it leaves the burners at the furnace entrance. One duplex strainer is placed in the suction line to the service pumps and the other in the discharge line to the burners. The strain-

ers are for the purpose of removing any grit or foreign particles from the oil which otherwise would plug up the small exit orifice in the burner sprayer plates.

7. Sometimes it is necessary to install the service pumps, heaters, and strainers as individual units in the fire room, especially where space is cramped; but if sufficient space is available, it is preferable to install the various parts as a unit, such as is manufactured by Todd. This unit consists of the various parts assembled on a common base pan with all interconnecting pipes, valves, fittings, and instruments complete, and is shop-erected and tested to classification requirements before installation in the vessel.

8. The heart of the installation, of course, is the oil burners.

With Scotch Boilers having Howden forced draft with three or four furnaces to each boiler, the furnace doors are removed; also the interior grate bars and bearer plates and bridge walls. The stack dampers are either removed or locked open. This equipment is usually stored somewhere in the ship to be available in case it is found necessary to change back to coal burning again. The Todd mechanical atomizing burners are attached to a door which fits and covers the firing aperture of the coal burning front. An expanding diaphram fits into the front end of the furnace for the purpose of directing the heater air into the atomized oil spray, thus ensuring high efficiency and easy control of the air-oil ratio. The installation is simple and a change from oil-firing to coal-firing can be accomplished in a minimum of time.

9. Only a number of minor operations are necessary to complete conversion: Installation of a cold starting apparatus which enables a ship with dead boilers to start up quickly; steam connections to be installed to pumps, heaters, etc.; torches and torch pots installed for lighting off burners, and the usual fire fighting equipment as called for by the Underwriters.

10. Very often when conversion to oil-burning is made, it is desirable to operate the galley ranges with oil burners. Todd makes a special galley range for oil burning and it is a simple matter to take a tap-off from the oil discharge line on the main oil burning system to the galley range.

The time required for the average conversion job, is three to four weeks, depending of course, on the amount of extra work involved and on the number of boilers.

If the pace of coal-oil conversion continues, there may soon come a time when another ship will make maritime history—the *last* one to make a voyage burning coal.

ON COAL-OIL CONVERSIONS

ROBERT DOLLAR HAD THIS TO SAY:

The following excerpt is taken from Captain Robert Dollar's book, "One Hundred Thirty Years of Steam Navigation," pages 89-90.

I'll never forget my first experience with oil fuel. It was in 1902 that I pioneered by equipping the cargo steamer *Arab* to burn oil, much to my sorrow. I went on her on a voyage from San Francisco to China. We had not proceeded very far before we discovered we did not know how to use the oil properly. We kept on changing and improving the defective equipment, and in the meanwhile we were approaching the Aleutian Islands, and it was in the dead of winter. Then our pumps positively refused to furnish oil to the burners, the oil being very heavy, far more so than any used at a later date.

Naturally our fires went out, but we had some coal so we managed to get steam on one boiler. Think of our situation—no steam, and drifting on to the Aleutians. In sheer desperation the Chief Engineer and I decided to take a chance. We drilled a hole in the bulkhead and allowed the oil to run under the boilers so it would get warmed up; then we used it.

What a terrible risk we took! If the oil had ignited, we could not have saved the ship. So while we were attempting this risky business I made my home in the boiler room, and I did not sleep much, either. When we got into the Sea of Japan I found we had coal enough to take us to Shanghai, so we cleaned up all the furnaces to burn coal. When this was finished I said, feelingly, "No more oil for me."

PACIFIC MARINE REVIEW, Vol. I No. II SAID:

Excerpt from Pacific Marine Review, November, 1904.

"The Nebraskan left New York August 7, 1902, touching at the ports of St. Lucia, British West Indies, and Coronel, Chile, for coal. She reached San Diego in fifty-seven days, five hours, and forty-three minutes. On that voyage 2,267 tons of coal of poor quality were used, and a fireroom crew of fifteen men found necessary. The ship was kept at full speed during the entire voyage.

"On the voyage from San Diego to New York, with a greater cargo in her hold, the voyage was completed in fifty-two days, seven hours and twenty-six minutes. There were consumed in the furnaces on this voyage 8,826 barrels, or 1,260 tons, of California fuel oil. Only six men were required in the fireroom. Their wages approximated $50 per month each.

"On the outward passage from New York to San Diego the ship steamed 13,280 miles, while on the homeward passage between San Diego and New York the ship steamed 12,760 miles, the increased distance on the outward passage being due to the fact that the ship called at both St. Lucia and Coronel for coal.

"Four hundred and fifty-seven tons of measured space for cargo was saved by reason of the oil fuel being of less bulk. The resulting financial gain to the company from all causes was at the rate of $500 per day. While five days were saved on the eastward journey, it must be remembered that the voyage was 520 miles shorter.

"The insurance risks, both on the vessel and on the

(Please turn to page 88)

Right: A view of the boiler room of the Pulaski, showing five Scotch-type boilers with three furnace doors each. The two coal piles are typical of a coal-burning boiler room. In this case, two of the furnaces are still being coal-fired to maintain essential services on the vessel.

Right: A boiler man crawls inside each furnace, dislodges the grates, and hands them to the men outside. Note the nose filter pad, worn to prevent the workers from breathing in coal dust.

Lower right: Workers remove the grating from the furnaces, preparatory to cleaning and installation of oil-burning equipment.

Below: The 6,856-ton Polish freighter Pulaski, lying at a berth in the Hoboken Division of Todd Shipyards Corp., where she will undergo a drastic rehabilitation job, involving conversion from coal-burning to oil; installation of an air conditioning system for all the cargo areas; redecorating of passenger and crew quarters, and the annual Lloyd's survey to maintain classification.

THE MOBILUBE

Arriving at San Francisco at the end of a long tow.

The Mobilube, during the long tow.

THE MOBILUBE

A GREAT TOW AND REPAIR JOB

SAGAS OF THE SEA seem to gain more flavor in the telling, and no exception is the tale of the *SS Mobilube,* a Socony-Vacuum Tanker which was hit by a Jap torpedo back in January, 1943, while outside of Sidney, Australia. With all undue credit to the Jap submarine commander involved, he did hit the target all submarine commanders aim for—a spot directly in line with the stack at the water line. This particular torpedo hit on the port side of the *Mobilube* and exploded underneath the port boiler, completely flooding not only the boiler but the engine room.

Built at Bethlehem's Sparrows Point yard in 1939 for Socony-Vacuum, the *Mobilube* has an overall length of 501′ 7¾″, beam of 68′ and a capacity of 133,833 bbls. when 100 per cent full. She was built with Bethlehem Freer System bulkheads.

The vessel was towed back to Sidney after the torpedo had done its damage and temporary frames were installed in way of the hole caused by the explosion. A "soft patch" was then put on over the hole. This "soft patch" consisted of 2½″ x 5″ Australian Gum wood boards which were bolted to the temporary frames, caulked and completely covered with a sheet metal sheathing. Approximately 250 tons of concrete were poured into the double bottom to fill holes not covered by the patch.

Her hull damage temporarily repaired, but her engines useless, the *Mobilube* was requisitioned by the Navy, renamed Yard Oiler No. 164, and placed in active service as a towed floating oil storage receptacle which followed advance fleet units in the attack on Japan.

Conclusion of hostilities saw her in Manila Harbor. In 1946 she was decommissioned by the Navy, towed to Subic Bay in the Philippines and turned over to WSA for disposal. Socony-Vacuum, her original owners, repurchased her and sent her original Captain, A. L. Clark, and Chief Engineer, R. L. Burley, from the United States to supervise the tow back.

The *Mobilube* left Subic Bay May 26, 1947, towed by another tanker, the *Yorba Linda.* The tow line consisted of 65 fathoms of anchor chain and 1,115 feet of manila rope, 12″ in circumference and 4″ in diameter.

When the ship reached San Francisco, 45 days and 3 hours out of Subic Bay, she had traveled 6,350 miles, the longest tow of its type in marine history. Her average speed for the voyage was 6.08 knots. All during the

The Mobilube, her torpedo damage repaired, is shown above at dock prior to being drydocked for installation of tail shaft and wheel.

►

Arthur Tamberg, Bethlehem Machine Shop Supervisor, points to hole torn in Mobilube reduction gear casing by forepdo explosion.

period of the tow the two ships were in constant contact with each other by portable radio which had a range of five miles.

Upon arrival in the Bay Area, the *Mobilube* was drydocked for survey at Moore Drydock Company's yard. Here her underwater body was sandblasted for external examination, and it was found that the port boiler would have to be completely renewed and rebuilt, and extensive repairs made to the starboard, as well as the obviously necessary repairs to the explosion-damaged shell plating and internal structurals.

At conclusion of the survey, Bethlehem Steel Company's San Francisco Yard was awarded the contract for repairing the vessel. She was drydocked at this yard a short time later and the job of removing the temporary soft patch begun. This patch was approximately 55'x32'.

◄

Chief Engineer R. L. Burley (left) and Captain A. L. Clark.

Lower left: Bethlehem Boilermakers are shown here repairing one of the Mobilube's boilers at the San Francisco yard. A shear legs barge was required to move the boiler from the dock to the ship.

The concrete also had to be removed before the steel plating, frames, etc., could be renewed.

When this was accomplished, all shell frames were renewed from the after peak bulkhead to the forward bulkhead of the fire room, from the tank top to the under side of the upper deck. All plating in way of the same also was renewed—plus 60 feet of flat and vertical keel, and the double bottom and tank top in way of the same.

All reduction gears and main machinery were removed from the ship and inspected in the yard's machine shop. The actual job of reconditioning this machinery was handled by its original manufacturer. The port boiler, which suffered the worst damage, was completely renewed by the Yard's Boilermaking Department and extensive repairs were made to the starboard boiler. It was this boiler that was kept in operation to run the vessel's pumps and electrical generating equipment while it was being towed as a floating oil storage receptacle.

A whole new boiler flat was installed, as well as foundations for boilers and all new auxiliary machinery.

Upon completion of the hull work, the stern frame was rebored and the rudder skeg and gudgeons straightened and rebored. The upper rudder stock was then stress-relieved, straightened and rematched. All machinery was reinstalled and the complete hull was sand-

Center below: View of the Mobilube on drydock at Bethlehem's San Francisco Yard. Upper half of temporary planking of "soft patch" has been removed revealing temporary frame. Lower right: Mobilube's huge reduction gear being inspected in Bethlehem's machine shop.

blasted from the waterline to the deck. Extensive stiffening was added throughout all cargo tanks, which were then filled and tested.

The ship was drydocked later in the course of the job and the tail shaft and wheel installed. All auxiliary machinery has now been put in and work of installing reduction gears, turbines and final alignment of the main machinery is now going on. The *Mobilube* will soon be ready for her dock trial and delivery to her owners.

The Mobilube Boiler Repairs

The repairs to the Foster Wheeler "D" type steam generators on the *Mobilube*, while not difficult in the light of wartime accomplishments, still were of a nature to give a shipyard estimator a few gray hairs.

With the exception of the two drums and three of the five headers, the port boiler was a total loss as a result of a direct torpedo hit, and no particular care had to be taken in burning it into sections for removal. The starboard economizer had to be cut loose and lifted out first before removing the boiler proper due to the limited space in the fidley.

Inasmuch as these boilers had originally been erected piece by piece on the ship, unlimited opportunity was offered for conscientious boilermakers to supplement the original designed bolted members with additional welding—and always in some inaccessible spot! This complicated matters, and we were somewhat dubious of the floating crane's rated capacity of 100 tons when it failed to budge the remaining 35 tons of the starboard boiler . . . until further investigation revealed that the floor pan had also been welded to the foundation.

From the outside, the starboard boiler appeared to be in fair shape. It was decided to renew all furnace and superheater tubes plus all the refractory and insulation. Upon removing these we found that extensive corrosion had taken place. Evidently the former operators had not lit off a drying-out fire for quite some time after the fireroom was pumped out.

This would also account for the necessity of having to renew all sheathing and insulation on the lined access doors and various panels. In spite of the corrosion very little of the casings had to be renewed since the thickness of Foster Wheeler marine boiler casings are more than ample.

Considerable distortion of the internal members was found and it was necessary to realign the steam drum slightly.

Some work had to be done on the salvaged pressure parts of the port boiler. This entailed welding.

While it was known that the outlet on the superheater header was badly twisted, it was not until the

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Westinghouse Repairs Gears and Gearcase on Mobilube

The Westinghouse plant at Sunnyvale is the only one on the West Coast capable of completely handling a repair job of this magnitude. Actual limiting factor, of course, was size of the hobbing machines available—and they have hobbers there capable of hobbing gears up to 160 inches in diameter.

The job at Sunnyvale comprised renewal of the bullgear shaft and flange, both of which were badly bent; re-rimming and hobbing of the low pressure high speed gear wheel (98¾ inches in diameter); rehobbing of bullgear (127½ inches in diameter), high pressure high speed gear (98½ inches in diameter), high pressure high speed pinions (8 inches in diameter), low pressure high speed pinions (11 inches in diameter) and all slow speed pinions (18 inches in diameter); repair of the very badly damaged gearcase (see photo), and

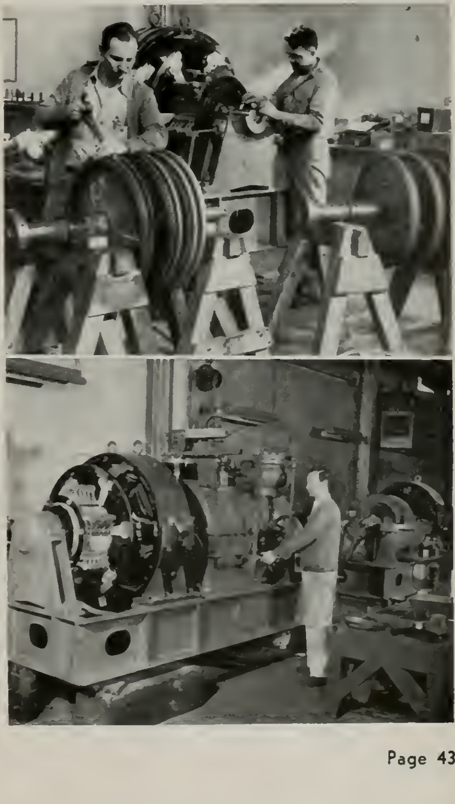
(Please turn to page 79)

General Electric Mobilube Turbine Generators

The 300-kw turbine generators on the *Mobilube* were laid up from 1945 to 1947 without precautions being taken to preserve the units. The ship was considered a dead loss and abandoned to the underwriters. Consequently, the turbine rotors and all moving and stationary parts were seriously corroded. The generator windings suffered badly from constant exposure to moisture, and in general the machines were borderline cases for complete renewal. Duplicate machines could not be procured in time to meet the completion schedule, so the General Electric Company, San Francisco, was given the contract to rebuild the machines regardless of cost.

Those who have seen the repaired rotors say there is nothing to distinguish them from new, and it is understood that they are ready to carry the full load.

During and after the repair of the 2 G.E. 300 kw. turbine generators on the Mobilube. The second unit is to the right in each picture, taken in General Electric's service shop in San Francisco.



U S-BUILT MOTOR SHIPS FOR FRANCE

M.S. AMIENOIS IS ONE OF a group of six ships contracted for by the French Supply Council in the United States with the Tampa Shipbuilding Company, as a step in the rehabilitation of the French merchant marine. Construction of these vessels is in line with the policy of making that country's new cargo fleet almost entirely of fast modern motorships.

The design for these six sister ships was prepared by M. le Reverend, Technical Manager for the Societé Anonyme de Gerance et d'Armament, or more briefly, S.A.G.A. Their design was worked out in such detail, including towed and self-propelled model tests, that preparations for their construction were begun as soon as the war ended. Contract plans and specifications were prepared by the Paris firm of naval Architects known as F.E.R.M.I., under the direction of M. Kervarec. With a considerable sum of unexpended French credits in the United States, it was decided to build six ships here to this design.

Of necessity, the contract plans were drawn up to Bureau Veritas rules, in the metric system, and to French standard of construction and equipment. On the basis of building to Bureau Veritas rules for hull construction, but substituting American standards and equivalent American equipment, the contract for these six ships was awarded to the Tampa Shipbuilding Company.

The ships are twin-screw shelter deckers, with raked stems, modified cruiser sterns, midships houses, and machinery aft and are fitted with 7,200 horsepower in Diesel engines. They are of all-welded construction except that frames and gunnel bars are riveted to the shell plating and gunnel bars are also riveted to shelter deck stringer plates

Principal characteristics of the ships are as follows:

Length overall	371′ 10 9/16″
Breadth molded	59′ 1 5/8″
Depth	29′ 2 3/8″
Draft	19′ 1 1/8″
Deadweight	3,770 tons
Cargo capacity, grain	251,000 cubic feet
Cruising radius	4,500 miles

Frames are spaced 27′ 5/32″, with a spacing of 24″ at the ends. An inspection of the lines and characteristics of these ships gives the impression that high speed was a primary consideration in their planning. This impression is correct, although there is no speed stipulation or guarantee in the contract, which merely requires a guarantee of power. That the vessels will have an unusual turn of speed is evidenced by their relatively small tonnage, fine-lined hulls, and their 7,200 horsepower.

(For purposes of comparison with American motor ships, the CIA cargo type has the following characteristics:

Length	412′3″
Beam	60′
Draft (loaded)	23′6″
Deadweight	7416
Shaft H. P.	4000
Crew (approx.)	40

Crew would be slightly larger if passengers were carried.—Editor)

The shapely hulls of these smart short-sea traders are divided transversly into fore peak, Nos. 1, 2, 3 and 4 holds, machinery space, and after peak. A continuous double bottom is provided, with a duct keel on the centerline in the way of No. 2, 3, and 4 holds. Main and shelter decks extend the full length of the ships. Above the shelter deck there is an extended forecastle, a midship house, and a long poop.

On the shelter deck forward in the way of No. 1 hatch there are strong rooms, emergency generator room, CO^2 cylinder room, paint and lamp lockers, and a winch-resistor room. Four refrigerated cargo boxes with a total capacity of 11,300 cubic feet are located on the shelter deck under the midship house.

The ships will carry a total complement of thirty-four crew members and twelve passengers. Unusually commodious quarters are provided for all hands, with separate single-bed rooms for each member of the crew—an unusual innovation for ships of this type and class. Berthing spaces for both passengers and crew have natural ventilation, augmented by electric fans, and hot-water heating. Interior sanitary spaces are equipped with mechanical ventilation.

Quarters for deck officers and an owner's suite are provided on three decks of the midship house. Above these are the wheel house and lower and flying bridges. On the poop are accommodations for engineers, officers' recreation rooms, and passenger spaces. The latter deserve more than passing notice.

Most cargo ships do little more than provide sleeping quarters for such passengers as they may carry. Passengers are berthed separately, of course, but they mess with the ship's officers and have no deck space of their own. In *M.S. Amienois,* however, they are provided with a light, airy, well-decorated dining saloon, and a bar and cocktail lounge. The poop and boat decks, which are planked, are also reserved for their exclusive use. This is an innovation which will appeal to many travelers who have spent their daylight hours promenading on the bare steel decks which are common to most modern cargo ships.

On the shelter deck around the engine casing are located quarters for unlicensed deck personnel, galley, mess rooms, and hospital. The unlicensed portion of the engine-room staff is berthed on the main deck aft.

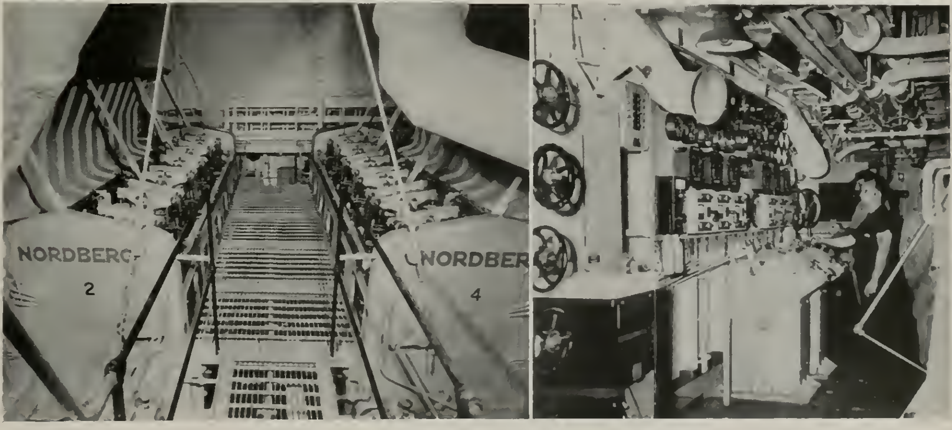
One of the most interesting features of these unique ships is the arrangement of their propelling machinery. The two shafts are fitted with three engines each, driving through electric couplings and reduction gears. Two engines of each propulsion unit are reversible, while the third operates in the ahead direction only. The engines are Nordberg six-cylinder, four-cycle, supercharged Diesels. They are of sixteen inches bore and twenty-two inches stroke, developing 1200 brake horsepower at 320 RPM, which would result in 1158 shaft horsepower at 200 RPM of the propeller.

The non-reversible engine of each propelling set has a dual function. It may be de-clutched from the reduction gear and connected to a 600 KW generator. When it is desired to operate the ship at full power in the ahead direction the generator is disconnected and the engine becomes a propelling unit. This arrangement permits either one of two main engines to be employed as generator engines in port when working cargo and eliminates the necessity of auxiliary generator sets usually found in more conventional motorships.

The system of controls devised by Nordberg engineers for handling this unique propelling installation is worthy of more than passing attention. Amidships, against the forward engine-room bulkhead are two control stands, one for each group of engines.

Each stand combines direct controls for two maneuvering engines with switches and levers for three electric couplings. The generator engines are operated by local controls on the engines themselves.

When working as propelling units, these engines are coupled to the propulsion system through the medium



View of engine room and (right) control panel, showing dual equipment.

of their electric couplings, which are operated from the central control stand forward.

The basic feature of the installation is that any one engine or all six may be idled under no load and clutched or declutched to or from the propeller shafts. To take care of such widely varying load conditions all six engines are fitted with Woodward idling and overspeed governors especially developed in collaboration with Nordberg engineers for such drives. When an engine is started under no load, it is, therefore, idled under automatic governor control at 150 RPM. After the load has been picked up by the electric couplings, however, its control and speed regulation is entirely mechanical.

The propelling machinery installed in *Amienois* and her sister ships affords a wide variety of operating combinations. These are,

a. Both main maneuvering engines, of the port or starboard groups, coupled to their respective shafts and running in the ahead or astern direction.
b. One main maneuvering engine only coupled to either propeller shaft, working ahead or astern.
c. Both engines of either the port or starboard groups idling in opposite directions of rotation making possible a quick reversal of propeller shaft rotation.
d. Both main propelling groups running in the ahead direction, with couplings energized and combined generating and propelling engines also coupled to the propeller shafts.
e. Emergency stop and reverse.

These operating combinations are made through the control stands mentioned above. Each stand is fitted with two latched levers, one for each of the two maneuvering engines of its group. These levers can be worked individually, as may be required by conditions (b) and (c) mentioned above, or they may be clutched together for operating conditions (a) and (b). A knobbed lever on the control stand actuates the clutch which connects or disconnects the two control levers. Another knobbed lever makes it impossible to move the engine control lever directly from the stop position into the fuel range on its quadrant without pausing in the start position. Another knobbed lever operates the electric couplings of the maneuvering engines, while a fourth one is provided for operating the coupling which connects the combination engine to the propelling system.

Assuming that it is intended to operate two maneuvering engines on one shaft in either direction, the control levers are clutched together and the engines started, with one lever working both units. The clutch between the two engine control levers is connected to a clutch control switch which is closed only when the clutch is engaged. This insures that both couplings of two maneuvering engines of one group can only be energized simultaneously when those two engines are being operated as a single unit by means of one lever.

With the engine idling under governor control, the coupling lever is moved in the same direction as the engine control lever. When two engines of the same group are idling in opposite directions, either may be instantly connected to its propeller shaft by energizing its coupling. Under such operating conditions, it is mechanically impossible to energize both couplings.

It should also be noted that an engine control lever, if moved to the stop position automatically de-energizes the electric coupling of that engine.

Should one of the combination engines be required for propulsion, it is started, with its governor set ten

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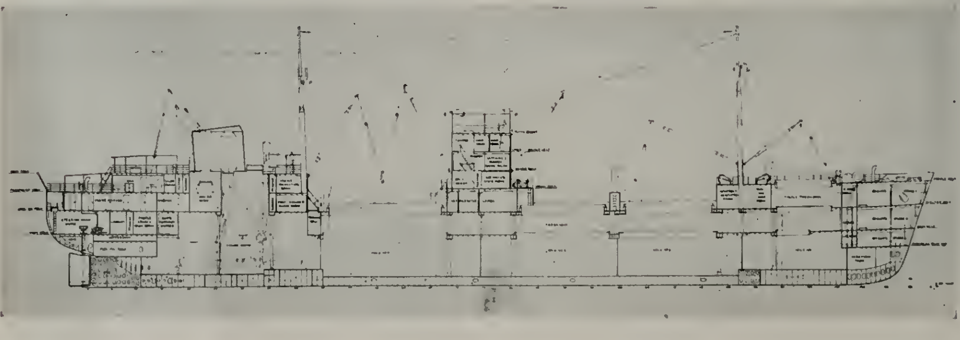
Right: The Engine. There are six, of 1200 hp. each, to total 7200 hp.

Below: Inboard profile of M. S. Amienois, showing location of engine room.



WORLD'S LARGEST CRANE

By W. C. RAUBE
Machinery Manufacturers Section, Industrial Engineering Division,
General Electric Company

The celebration of Navy Day during the week of October 20 to 27 brought to public attention in San Francisco the world's largest overhead traveling crane at Hunters Point.

THE NEED FOR INCREASED HIGH-SPEED repair service on warships for our Pacific fleet has resulted in the purchase by the Navy Department of two enormous bridge cranes to be operated on one runway. These cranes, which incorporate many novel features, were built by the Alliance Machine Company of Alliance, Ohio, for installation at the U. S. Naval Drydocks, Hunters Point, San Francisco.

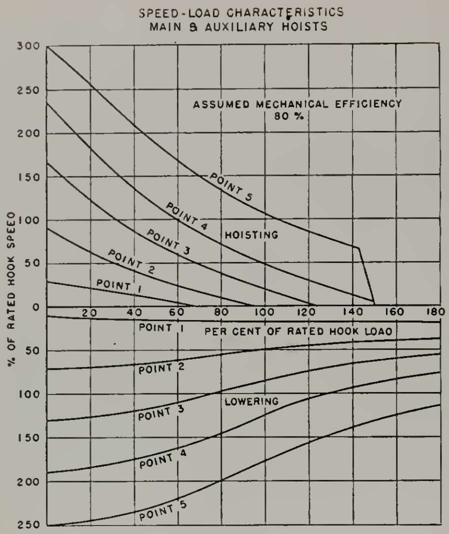
General Data and Capacities. The cranes, with 142 feet span and side girders 22 feet deep, are mounted on a 730-foot runway which spans a pier 405 feet wide. The runway's fixed cantilever arms therefore reach 162½ feet over the water on each side of the pier. The runway, built by the American Bridge Company, is supported on four towers, 35 feet by 50 feet at their bases, placing the bridge runway rails 182 feet, and the tops of the trolleys 207 feet, above mean high-water level, or 201 feet above the deck of the pier. The centers of the supporting towers are 320 feet apart crosswise and 142 feet apart lengthwise of the pier.

The 18 motors will draw more electric energy than is consumed by the entire city of Sausalito, according to General Electric Company engineers who designed and built the electrical equipment, working in cooperation with the Navy Department engineers from the Bureau of Yards and Docks, Washington, D. C., and the engineers of the Alliance Machinery Company.

Officers at the San Francisco Naval Shipyard described the structural giant in terms of the area of the two blocks on which the San Francisco City Hall stands. If the center of the crane were located in the middle of the City Hall so that the longest axis paralleled Van Ness Avenue, the ends would project almost to the far side of Grove Street on the south, and to the far side of McAllister Street on the north.

The San Francisco Naval Shipyard officers responsible for the construction of the crane are Commander L. J. Stephenson (CEC) USNR, Navy Project Superintendent, and Captain W. T. Eckburg (CEC) USN, who is Public Works Officer in charge of all shipyard construction.

The prime contractors are: for the foundation, the Gerwick-Morrison & Twaits group which includes Ben C. Gerwick Company, Morrison, Knudsen and Twaits



Speed-load curves for master control points hoisting and lowering one main hoist. The upturn of the lowering curves with increasing loads is the paradox of the Maxspeed system.

Company; for the steelwork the American Bridge Company; materials supplied by the Construction Aggregates Corporation and the Columbia Steel Company; the cranes erected by the Alliance Machinery Company, and the electrical work by the General Electric Company.

Each crane is equipped with a single trolley carrying a main hook and an auxiliary hook. The main hook has a rated capacity of 225 long tons (approximately 250 short tons) at 10 feet per minute hoisting speed, while the auxiliary hook has a rated capacity of 50 long tons at 30 fpm. Both hoists are being tested under 125 per cent load.

For handling loads in excess of 225 long tons, provision is made for tandem operation by coupling the two cranes together with standard car couplers. As far as bridge propulsion is concerned, the two cranes then function as a single crane. An equalizer beam with a giant, double-barbed swivel hook in its center is suspended from the two main hooks, giving a combined rated hoist capacity of 450 long tons (approximately 500 short tons) at 10 fpm.

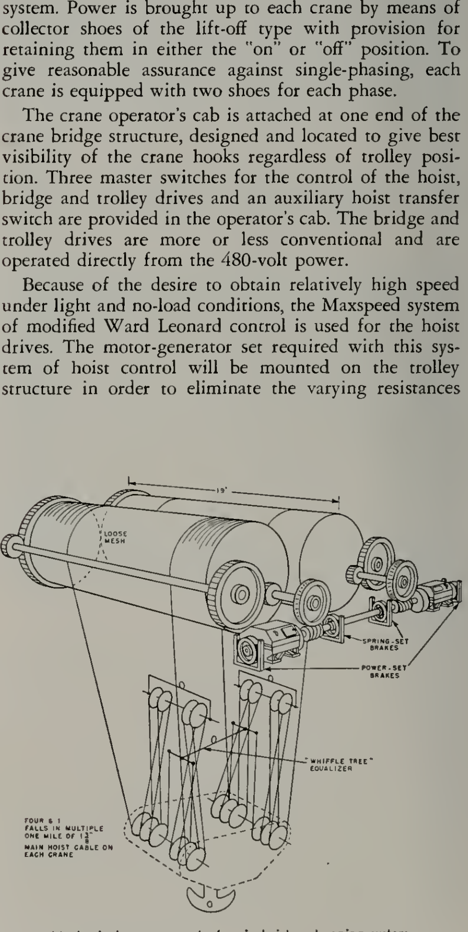
The weight of each crane, complete with trolley and rated pay load of 225 long tons, is approximately 1,734,000 pounds. During tandem operation, the weight of the two cranes, complete with equalizer beam and 450 long-ton load, will be 3,568,000 lbs. (1784 short tons). This close concentration of weight at either end must be carried by the runway cantilevers with the centerline of the total load 96 feet beyond the outer edge of the runway supporting towers and 78½ feet out over the water. During single-crane operation, the center of its 225-ton load can be carried out 130½ feet over the water or 148 feet beyond the outer edge of the runway supporting towers.

The cable capacities of the hoist drums will be such as to allow vertical operation of the main hook through 185 feet, from 25 feet below to 160 feet above water level and the auxiliary hook from 35 feet below water level to a point as high as the crane design will permit.

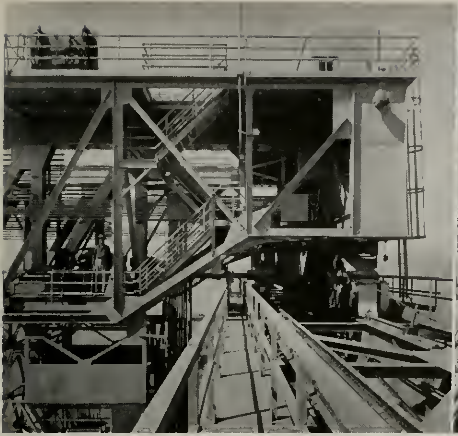
Power Supply. Power for operating the cranes will be taken from a substation located in the upper section of number one tower of the runway supports. Here incoming 11,500-volt, 60-cycle power is stepped down to 480 volts in a 1000-kva, 3-phase air-cooled transformer. A 480-volt line leads down, across and up to a 25-kva, 480/120/208-volt substation, over number two tower for lighting and small power uses. Crane power, after passing through a triple-pole, 1600-ampere circuit breaker, is carried out along one of the runways where it is tapped at eight points to a three-bar collector-rail system. Power is brought up to each crane by means of collector shoes of the lift-off type with provision for retaining them in either the "on" or "off" position. To give reasonable assurance against single-phasing, each crane is equipped with two shoes for each phase.

The crane operator's cab is attached at one end of the crane bridge structure, designed and located to give best visibility of the crane hooks regardless of trolley position. Three master switches for the control of the hoist, bridge and trolley drives and an auxiliary hoist transfer switch are provided in the operator's cab. The bridge and trolley drives are more or less conventional and are operated directly from the 480-volt power.

Because of the desire to obtain relatively high speed under light and no-load conditions, the Maxspeed system of modified Ward Leonard control is used for the hoist drives. The motor-generator set required with this system of hoist control will be mounted on the trolley structure in order to eliminate the varying resistances



Mechanical arrangement of main hoist and roping system.



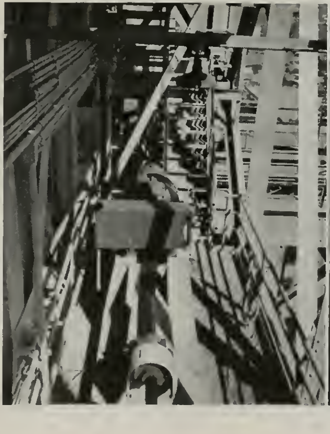
Upper left: Looking down the runway at Hunters Point Crane.

Above: Another view of the world's largest crane.

Left: The two bridges on the biggest crane in the world, looking down the runway. The three rails at the left supply the electrical power much like "third rails." The single rail at the far left supports one end of the bridge carriage.

Right: A 50 hp G. E. induction motor showing the drive shaft to the bridge carriage.

Far right: One of the 8 G. E. 50 hp induction motors which provide motive power to the bridges. Below is an AK and the forward part of a U. S. cruiser.



of sliding collector shoe contacts in the main power and field circuits, thereby increasing the reliability of the hoist drive.

Since the main and auxiliary hoists are not required to operate simultaneously, the motor-generator set provides sufficient generator and driving motor capacity to supply the larger of these two hoists, i. e., the main hoist drive. A transfer drum switch in the power circuit is pilot motor operated. It is located on the trolley and is controlled by a three-position switch located in the operator's cab and which transfers the control of either the main hoist or auxiliary hoist to the hoist master switch in the operator's cab.

The capacity of the main hoist is approximately twice that of the auxiliary hoist, and in order to use duplicate equipment where possible, two MD totally-enclosed waterproof motors are used on the main hoist and one duplicate motor on the auxiliary hoist. They are rated 135 hp, 470 rpm, 230 volts for 30-minute duty, 75 C rise. Two duplicate 125-kw, 1800-rpm generators are provided on the motor-generator set for supplying the hoist power requirements. When operating on the main hoist, the two hoist motors and the two generators are connected in a loop circuit with the generators and motors alternated to limit the ceiling voltage between any two points in the loop circuit to a voltage not in excess of that of a single machine.

For auxiliary hoist operation, only one generator is required. In the preceding paragraphs it was pointed out that although there were only two hoists on each crane, the power transfer switch provided three positions. One position, obviously, is for establishing the connections for the main hoist. The other two are for connecting the auxiliary hoist motor to one generator or the other. The transfer switch permits setting up an operating schedule whereby the generators can be alternated at periodic intervals for the following reason. The preponderance of hoisting duty falls on the auxiliary hoist, during which time both generators are running, but one generator delivers no power. It is a well-known fact, although not easily explained, that a generator develops commutator grooving much faster when not delivering power than when delivering power.

Bridge Drive. The bridge drive on each crane will be powered with four Type MR totally-enclosed waterproof, wound-rotor induction motors operating in parallel, geared to give 100 fpm bridge travel. The motors will be rated 50-hp, 600-rpm, 30-minute basis. There will be two motors on each end of the bridge with shafts connecting the two drives to hold the crane in line. Each motor will be equipped with a full torque electric brake.

The bridge motors are controlled from a quadruplex magnetic control with reversing and plugging features

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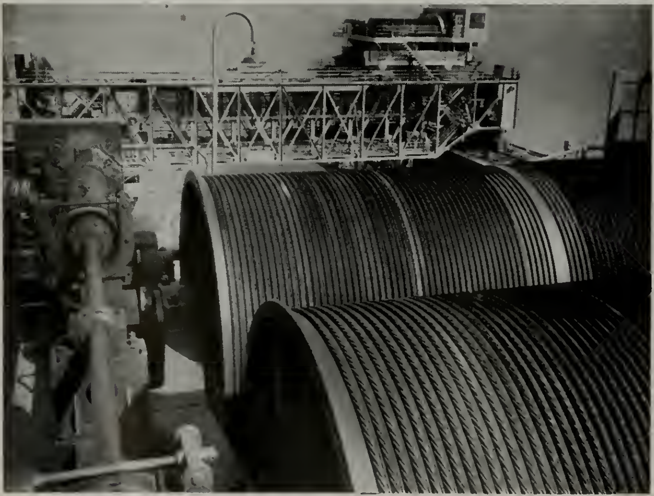


Two more views of the world's largest crane. The housing in the upper picture is repeated in the lower one, and the winding drums in the foreground below are shown in the housing structure of the forward hoist in the background.

DEVELOPMENT OF SHIP FORMS

By WILLIAM A. BAKER, Assistant to Naval Architect,
Bethlehem Steel Company's San Francisco Yard.

Part I


William A. Baker

Historical

The earliest seaman, sitting astride a log and paddling his way from one river bank to the other with his hands, knew nothing of frictional resistance or propulsive coefficients. His simple problem was to move the log's cargo—himself—across the river. As community life developed and some form of transportation became necessary, it was natural for man to turn to transportation by water as the easiest and cheapest—rivers at first and as his vessels improved, coastwise and then deep sea voyages. The inhabitants of river villages could fasten together a few logs forming a raft on which to transport themselves or goods down river by simply floating with the current. The first problem in the resistance and powering of ships came when they tried to go upstream with their ungainly raft.

Other craft in use today in various parts of the world which have existed since ancient times are rafts of inflated skins, wicker baskets daubed with pitch or clay, and canoes made of bundles of reeds lashed together. Samples of all may be found in early rock carvings of the Assyrians and Egyptians.

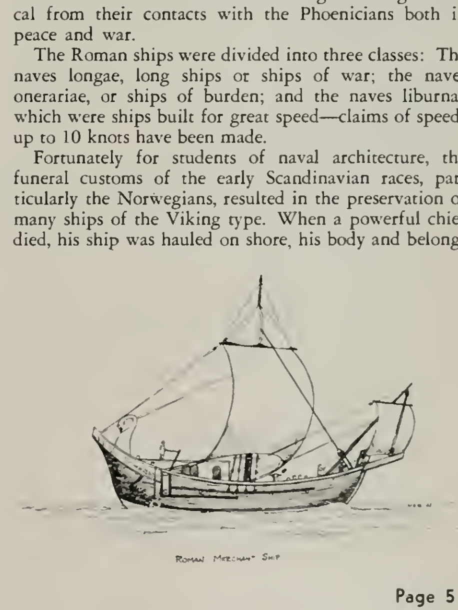
The intended service and principal motive power of the early vessels had much to do with their shape. The paddled or rowed ships—natural descendants of the dugout—remained for a considerable period relatively narrow for their length. The early commercial operator, already grousing at the high cost of motive power—even galley slaves had to be fed—turned to sail, using oars only to help in maneuvering in and out of harbors and in calms at sea. In order to carry as large a cargo as possible the sailing vessel became quite chunky.

The Phoenicians, the world's first great seafaring race, were responsible for many improvements in the galley. Generally speaking their ships were similar to the Egyptian ships of about 1200 B. C. but, being seagoing vessels instead of river craft, they had more beam, draft and freeboard thus carrying larger cargoes on the same length. The greatest difference was that they substituted a ram for the overhanging bow, thus necessitating full buoyant lines to support its weight. The Phoenicians invented the bireme and trireme—vessels with two and three banks of oars—in order to obtain more power without increasing length and with but moderate increase in freeboard. Their vessels must have been of considerable size for Herodotus reports that in the fifth century B. C. a fleet in the employ of the Egyptians circumnavigated Africa taking about three years for the voyage.

The Greeks received their knowledge of things nautical from their contacts with the Phoenicians both in peace and war.

The Roman ships were divided into three classes: The naves longae, long ships or ships of war; the naves onerariae, or ships of burden; and the naves liburnae which were ships built for great speed—claims of speeds up to 10 knots have been made.

Fortunately for students of naval architecture, the funeral customs of the early Scandinavian races, particularly the Norwegians, resulted in the preservation of many ships of the Viking type. When a powerful chief died, his ship was hauled on shore, his body and belong-


ROMAN MERCHANT SHIP

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* This is in part a talk before the Naval Architects and Marine Engineers, San Francisco. Additional installments will follow.

ings placed in a special enclosure built in the bow and a huge mound of earth raised over the whole. While many such burial mounds have been discovered, dating between the second and tenth centuries A. D., perhaps the best known is the Gogstad ship, a replica of which was sailed across the Atlantic and exhibited at the Chicago Exposition of 1893. She proved a wonderful seaboat. Her length over all is 79 feet 4 inches, her breadth 16 feet 6 inches and depth 6 feet amidships, 8 feet 6 inches at the end—slightly over 27 tons. The main propulsion was by sail but in addition she was fitted for sixteen oars on a side.

The Crusades brought large fleets of Northern seamen into the Mediterranean for the first time and provided a meeting of minds that produced ships combining the best features of both regions. During the fourteenth and fifteenth centuries there was a gradual increase in the size of ships, refinements in hull form and improvements in rig. As far as is known at present, ships were built by rule of thumb based on proportions that had proved successful in service but one should not assume that all were chunky and dull sailers. Because of limitations of structural materials and a lack of engineering knowledge, length was restricted so that considerable breadth and draft were necessary to carry guns and stores on fighting ships and to enable the merchant ships to carry cargo economically. Builders have always known how to produce speedy vessels—witness the naves liburnae and the Viking ship.

These developments resulted in the ships of the early explorers—of Columbus, Magellan and countless others—but in spite of research and the building of numerous models and replicas none can tell for certain exactly what they looked like. The "Santa Maria" of Columbus, a ship of about 100 tons, is often regarded as a tub, yet she made 200 miles in a day's run, an average of nearly 8½ knots. The best available information at present gives her a length of keel, 64 feet, length from stem to stern, 81 feet, breadth, 27 feet, and depth, 13 feet 6 inches. Thus the length/breadth ratio is still the three of the old Roman ships but the depth is reduced to one-half the breadth although the ends are raised by the fore and aftercastles.

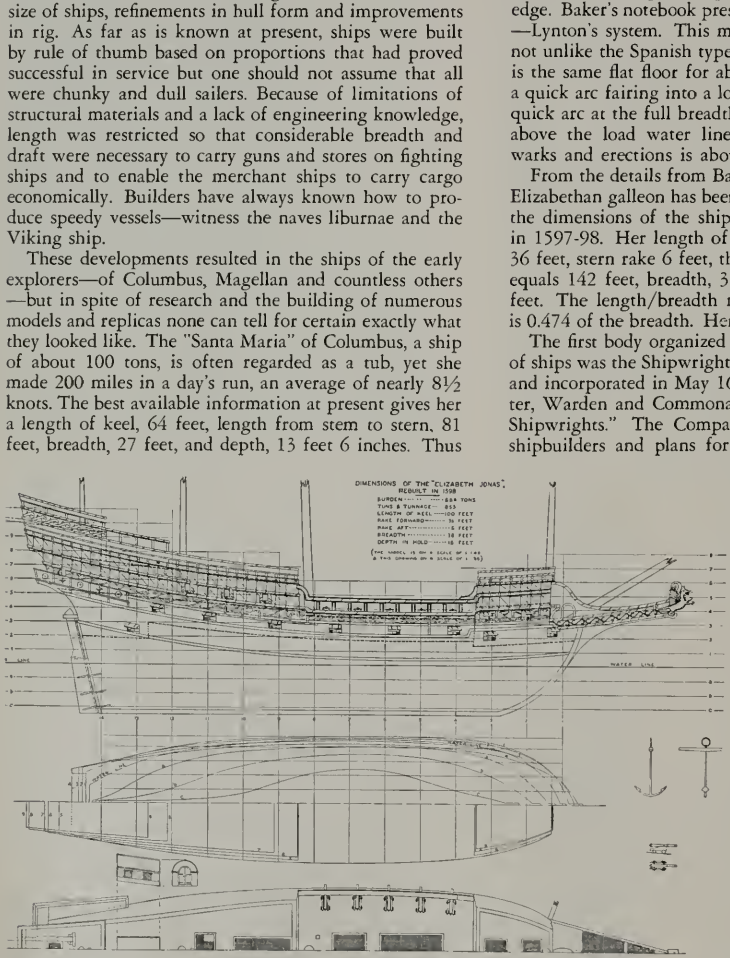
In the above length/breadth ratio the length from stem to stern was used as it more nearly represents the present day length between perpendiculars than does the length of the keel. For a considerable period the early shipbuilders were limited to a length of keel equal to that of the longest tree available; the first keel scarph was made with great trepidation. To gain length the stem and stern were raked. Because of the rudder the stern rake was small but the fore rake was an arc of a circle—nearly tangent to the keel and vertical at the deck.

During the early recorded period of naval architecture it was common practice to shape a ship's sections by some system using only a pair of compasses and a straight edge. Baker's notebook preserves an early English version—Lynton's system. This method produced a midsection not unlike the Spanish type previously mentioned. There is the same flat floor for about one-third of the breadth, a quick arc fairing into a long arc which ends in another quick arc at the full breadth about one-third of the draft above the load water line. The tumble-home of bulwarks and erections is about 20°.

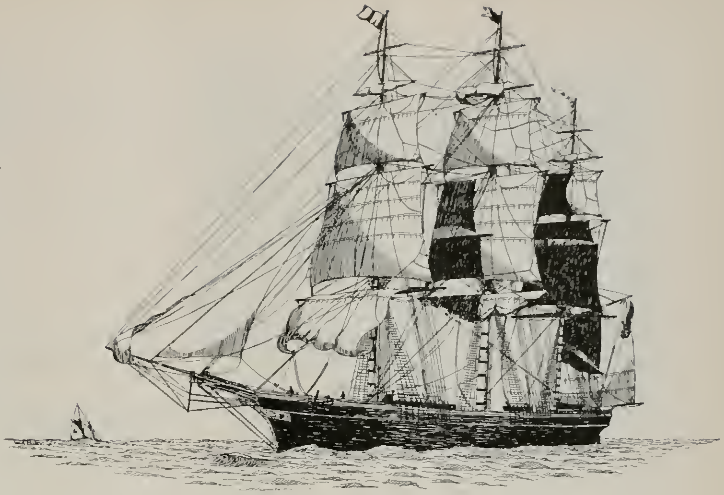
From the details from Baker's notebook a model of an Elizabethan galleon has been constructed using as a guide the dimensions of the ship "Elizabeth Jonas" as rebuilt in 1597-98. Her length of keel was 100 feet, fore rake, 36 feet, stern rake 6 feet, thus length from stem to stern equals 142 feet, breadth, 38 feet and depth of hold, 18 feet. The length/breadth ratio is 3.73 while the depth is 0.474 of the breadth. Her tonnage is given as 855.

The first body organized to deal with the construction of ships was the Shipwright's Company, founded in 1605 and incorporated in May 1612 by a charter to the "Master, Warden and Commonalty of the Art or Mystery of Shipwrights." The Company had jurisdiction over all shipbuilders and plans for all ships of the royal navy required their approval.

Sir Anthony Deane is the first known to have applied mathematical science to naval architecture. To quote Pepys' Diary for the 19 May 1666 "And then he fell to explain to me his manner of casting the draught of water which a ship will draw beforehand, which is a secret the king and all admire in him; and he is the first that hath come to any certainty beforehand of foretelling the draft of water of a ship before she be launched." Deane also had a system of drawing the lines of a ship similar to Lynton's mentioned previously. His system produced a rounder bilge than the earlier method.



Dimensions of the Elizabeth Jonas.



Ship "Flying Cloud", 1851

Based on Dean's system, a naval ship with a keel length of 100 feet would have a breadth of 30 feet (33 feet for a merchantman), fore rake 22 feet 6 inches, stern rake 4 feet 7 inches. Thus the length from stem to stern is 127 feet 1 inch and the length/breadth ratio is 4.24—much finer than any previously-noted sailing vessels. In spite of being the practice of nearly a century later than Baker, the proportions and general shape are much the same and it will be found that except for minor details there will be little change until about 1750. One noticeable feature during this period is the gradual lifting of the full transom out of the water; it it fully clear by about 1770.

In light of modern knowledge of resistance of ships, the various systems of drawing ships' lines with a pair of compasses in conjunction with the proportions then in favor produced a body plan worthy of note. The midsection is essentially a rectangle with the bilge cut off at a 45 degree angle and the remaining sections are roughly parallel to each other as they progress towards bow or stern. It may have just happened, or some unknown designer was years ahead of his time. In 1921 a German naval architect, in trying to produce a form of minimum resistance through a series of tank tests, arrived at a rectangular section with the bilge cut off at 45 degrees and the other sections parallel to the sloping portion. This is patented under the name "Maier-form."

In spite of all the scientists and practical shipbuilders there was little real progress in improving the form of ships. This failure can be attributed to many reasons. The theorists knew little or nothing of the practical side of shipbuilding or handling, the practical men were weak on theory, while the experimenters lacked proper equipment and could not or did not try to coordinate their efforts.

At the end of the eighteenth century the length/breadth ratio of ordinary merchant and naval vessels was about 3.75 or less with the depth to main deck about 0.55 of the breadth. The following table shows how little the size and proportions changed in about 150 years—the data is for a 70 gun ship of the line:—

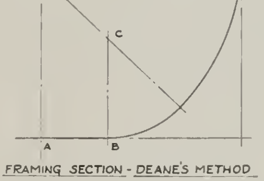
	1677	1706	1719	1733
	ft. in.	ft. in.	ft. in.	ft. in.
Length on Gun Deck	150 0	150 0	151 0	151 0
Length of Keel	....	122 0	123 2	122 0
Breadth, extreme	39 8	41 0	41 6	43 5
Depth in hold	17 0	17 4	17 4	17 9

	1741	1745	1830
	ft. in.	ft. in.	ft. in.
Length on Gun Deck	154 0	160 0	180 0
Length of Keel	125 5	131 4	146 8
Breadth, extreme	44 0	45 0	54 0
Depth in hold	18 11	19 4	22 4

A serious attempt to better the scientific knowledge of naval architecture was the organizing in 1791 of a "Society for the Improvement of Naval Architecture" in England. The Society was founded largely through the efforts of Colonel Mark Beaufoy and included the Duke of Clarence, who became William IV, and many noblemen and others of influence. A series of experiments on ship resistance were conducted by the Society between 1793 and 1798 but due to exhaustion of funds only a preliminary report was published. Later, Mr. Henry Beaufoy published a complete account at his own expense.

The resistance experiments were made with submerged bodies of various shapes at speeds varying from 1 to 8 nautical miles per hour. Drawings showing the shape of the bodies tested, the towing mechanism (falling weights) and some of the results were attached by Robert Fulton to his U. S. Patent Specifications in 1809. The Society seems not to have understood wave-making resistance as such. The normal diverging bow wave was readily apparent but any small resistance wave at the

(Please turn to page 100)



FRAMING SECTION - DEANE'S METHOD

AB = 1/6 MAX BEAM BC = 1/4 MAX BEAM
DE = 7/9 BC ARC FROM G = 29/36 MAX BEAM
EF = 17/18 HALF BREADTH - REVERSE TO DECK - SAME RADIUS

- - With The

Port Engineer of The Month

LOS ANGELES

Edward L. Harris
of Pope & Talbot Lines

Upon discharge from the Navy in 1923, Edward Harris joined the Merchant Marine as an oiler on the *Maricos H. Whittier* for the Associated Oil Company. He remained on the *Whittier* until he secured his original Second Assistant's license early in 1924, when he was transferred as Third Assistant on the *Paul Shoup* with the same fleet. He then served at various rates on such well-known tankers as the *Herron, Buck* and *Drum.* After securing his Chief Engineer's license he returned to service on the *Paul Shoup* in 1934 as Chief Engineer. He remained as Chief Engineer with Associated Oil until 1941, when he joined the Alcoa Steamship Company as First Assistant Engineer on the *Alcoa Pilgrim,* under construction at Bethlehem, San Francisco, as part of the original C-1 construction program of the Maritime Commission. After delivery of the *Pilgrim* to New York, he served as Chief Engineer of the vessel, remaining on her until the first of May, 1942.

Ed served in the Caribbean run during the five months immediately after Pearl Harbor, the time of our highest losses in that area. He then transferred, as Chief Engineer, to the *Alcoa Pennant* on the Pacific Coast, serving in the Pacific area until late December 1942. At this time he was ordered ashore by Alcoa to take charge and delivery of six C-1's under construction at the Consolidated Steel Corp. in Wilmington for delivery to Alcoa Steamship Company as owners. In conjunction with Capt. P. E. Odeen, after delivery of the vessels at Consolidated, offices were opened in San Francisco, and for the next two years he was in charge of all activity for the Alcoa Steamship Company on the West Coast, which included the maintenance and repair of a total of 36 vessels owned and operated by them.

Ed joined Pope and Talbot Lines in February 1945 as Assistant Port Engineer, and was transferred to the Los Angeles area in July 1946. The happy grin indicates that he likes his work.

WALTER HILL ADDRESSES SAN FRANCISCO SOCIETY

At its November meeting, the San Francisco Society of Port Engineers heard a very fine talk on boiler construction, given by Walter B. Hill on the construction of Babcock & Wilcox boilers. After a learned discussion of boiler operation and the solution of operating problems, Walter showed a sound picture on the manufacturing of boilers and their place in the merchant marine. After the picture, he and Larry Rapp ably presided over an hour of technical discussion from the floor. An article including the descriptive processes from the sound picture is being specially prepared for publication, and will appear in an early issue. A brief review of the film will be found on page 56.

Included are A. R. Isaacson; J. A. Harris; G. W. Duncan; H. I. Morrison; E. P. Larned. This picture and the one below were taken at the S. F. Port Engineers Meeting.

W. E. Sizemore; T. Klitgaard; A. C. Disher; Ray E. Baker. Did we catch Bill Sizemore smiling?

Port Engineers -

Something New In The Social Life of San Francisco

The Society of Port Engineers, San Francisco

FIRST ANNUAL
CHRISTMAS DINNER DANCE

Gold Room, Fairmont Hotel
Friday, December 12, 1947 — 8:30 P.M.

Reservations limited. Members get first choice at tickets for themselves and their friends. Deadline for member reservations Friday, November 21st.

TARIFF $7.50 each

Dress: Ladies, formal
Gents, optional

At the San Francisco Port Engineers meeting. Walter Hill addresses the meeting, and Frank Smith likes one of Butch's jokes.

Frank William Smith

Port Engineer of the Month

SAN FRANCISCO

FRANK WILLIAM SMITH,
of American Mail Lines.

Not to be confused with Pacific Marine Review, which was also born in Seattle, Frank William Smith is port engineer for American Mail Line in San Francisco, and president of the Society of Port Engineers.

Frank heard the call of the sea in 1909, and from then until 1917 he climbed the ladder of ratings to his chief engineer's license. With the start of war in 1917, he sailed from Seattle as first assistant engineer on a Standard Oil tanker, and was made chief on arrival in New York. He remained with Standard of New Jersey until 1919, when he became guarantee engineer for the Hog Island Shipyards, and sailed on a number of the Army transports built there.

As No. 1 on the eligible list for the Electric Drive School at General Electric, Schenectady, Frank attended and was subsequently appointed guarantee engineer for the Shipping Board, assigned to New York City.

But shore-side business needed a good man, and Frank became vice president and sales manager of a printing machinery concern where he remained for 20 years. The war saw him back in the engine room as chief engineer out of San Francisco until W. S. A. called him in and there he stayed to war's end, when he joined American Mail Lines as port engineer.

Some marine officers love to recall the ships on which they sailed, and their lives are logged by ship names and dates. In the case of Frank Smith, the outstanding contribution to the industry is the formation of the Society of Port Engineers, of which he is president. Along with Joe Gisler and some others, the port engineers organized the first such society in the United States and their efforts have been copied in other ports. The San Francisco society sets a fast pace and is a credit to the industry and to Frank Smith's efforts.

PORT ENGINEERS AT SEATTLE HOLD SPECIAL MEETING FOR COMMODORE SHEPHEARD

▲ AT THE MEETING

Left to right: Commodore H. C. Shepeard, U.S.C.G.R., Chief Officer of Merchant Marine Safety; Joe Sweetlin, President Society of Port Engineers of Puget Sound; Frank Howard, V.P. Society of Port Engineers of Puget Sound, American Mail Line; Lt. Col. H. C. Dodenhoff, Transportation Corps, U. S. Army; E. S. Raney, Supt. of Luckenbach Steamship Co.; Robert G. Zener, General Mgr. Todds Drydock at Seattle.

▲ AT SEATTLE PROPELLER HONORING ADMIRAL FARLEY

(Top) Left to right: Mayor Wm. F. Devin, of Seattle; Adm. J. F. Farley, Commandant U.S.C.G.; Capt. Alex Peabody, President Black Ball Lines; Robert Albin, President Ames Terminals, new President of Propeller Club; Com. H. C. Shepheard, U.S.C.G. R., Chief Officer of Merchant Marine Safety.

(Bottom) Left to right: Rear Adm. F. A. Ceusler, U.S.C.G., retired, now asst. to Pres. of Alaska Steamship Co.; Capt. Neils Haugen, U.S.C.G., rep. 13th Dist. Coast Guard, Ketchikan, Alaska; Commodore J. E. Stike, commander 13th Coast Guard Dist.; G. W. Skinner, President of Alaska Steamship Co., Skinner & Eddy Corp.; Col. Leland Hewitt, War Dept. Dist. Engineer.

▲ Left to right: H. W. McCurdy, Pres. Puget Sound Bridge & Dredge; Col. Wm. H. Donaldson, Jr., Commanding Officer Seattle Port of Embarkation; Al Litner, Pres. American Mail Line; Rear Adm. Wm. H. Munter, U.S.C.G. (Ret'd.); Lt. Com. C. R. Bender, U.S.C.G., Aide to Adm. J. F. Farley.

◄ MORE PROPELLER CLUB

Left to right: Harold J. Wrigley, International Paint Co.; Capt. Carl Ganong, U.S.C.G.; Robert LeBlanc, General Mgr., Everett Pacific Shipbuilding & Drydock Co.; Commander Hebert E. Peters, U.S.C.G.; S. K. Smith, Mgr. Seattle Office, American Bureau of Shipping.

FILM SHOWN BY WALTER B. HILL

The scenes take place at a large Eastern shipyard where step-by-step assembly of the boiler is shown. As each step occurs, the film cuts to a drawing which highlights the particular parts being installed, thus making it simple to follow the assembly.

After the assembled boiler has been lowered into a destroyer, animated drawings are used to show the flow of water, steam, air, oil, and combustion gases through the unit.

The final scenes show various Naval and Merchant vessels lined up for review.

The scene then shifts to the B&W Works at Barberton, Ohio and shows important operations in the fabrication of boiler components. In addition to illustrating the steps in the manufacture of a drum (forming, machining, welding, etc.) the film shows the fabrication of headers, studded tubes, sprayer plates and oil burners.

Pacific
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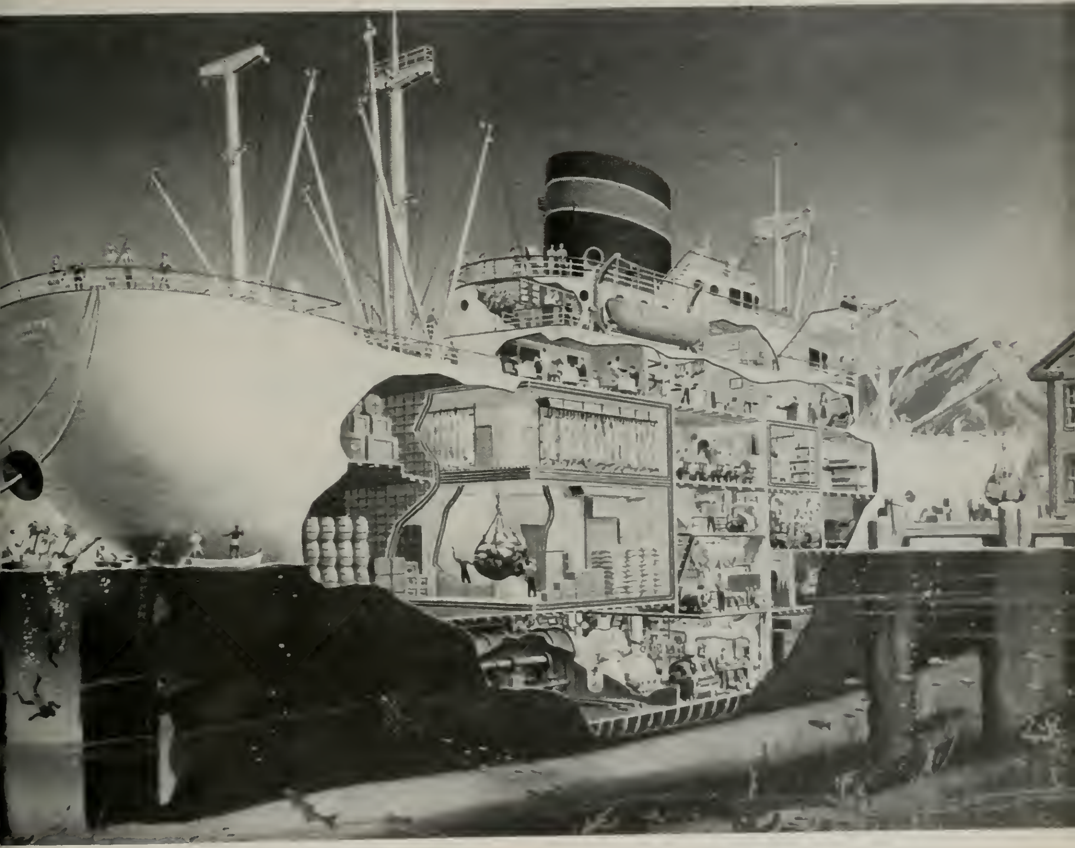
TRADE
Reg. U. S. Pat. Off.



HOW A SHIP OPERATES

The many services a modern steamship provides are explained and illustrated in a full color page advertisement entitled "How a Steamship Operates" in the November 22 issue of The Saturday Evening Post.

The presentation was prepared by the Building Materials Division of the Armstrong Cork Company in cooperation with the National Federation of American Shipping.

One of the features of the advertisement is the cutaway view and accompanying diagram of a typical modern steamship. Readers are taken behind the scenes and shown how the steamship is constructed to combine luxurious passenger service with large-scale cargo transport.

The copy reads in part:

"When you take that cruise you've dreamed about, you may sail on a ship like this. From the swimming pool to your air-conditioned stateroom, you'll enjoy the same comforts you find at a resort hotel ashore. But, below decks, this ship is a hard-working freighter, carrying tons of cargo to many ports of call.

"To combine luxurious passenger service with large-scale cargo transport, a steamship is like a city afloat. Like a city, a ship has to have its utilities. Most of them are based on heat and cold. Heat is generated to drive the ship and for many other purposes. Cold is needed for air-conditioned comfort and to guard perishable cargo from spoilage. To avoid wasting valuable heat and cold, a great deal of insulation is built into the structure of a modern steamship."

As part of the presentation, enlargements of the cutaway view are being offered free to readers. The 21" x 22" enlargements are in full color for framing.

TARIFF AND TRADE AGREEMENTS CONCLUDED AT GENEVA

The Geneva Agreement is the most comprehensive international instrument ever negotiated for the reduction of barriers to world trade, having regard both to the scope of its provisions and to the volume of trade which they affect. The provisions of the Agreement extend to trade barriers and trade controls of all kinds, including tariffs, preferences, quotas, internal controls, customs, regulations, state trading and subsidies. The twenty-three countries participating in the negotiations were Australia, the Belgium-Netherlands-Luxemburg Customs Union, Brazil, Burma, Canada, Ceylon, Chile, China, Cuba, Czechoslovakia, France, India, the Customs Union of Lebanon and Syria, New Zealand, Norway, Pakistan, Southern Rhodesia, the Union of South Africa, the United Kingdom, and the United States. These countries accounted, in 1938, for approximately three-quarters of the international trade of the whole world.

All concessions made by the United States were formulated within the limits and according to the procedures specified by the Trade Agreements Act and Executive Order No. 9832 of February 25, 1947. As required by the Executive Order, the General Agreement provides that if, through unforeseen developments, a particular tariff reduction should increase imports so sharply as to cause or threaten serious injury to domestic producers, the country granting the concession may withdraw or modify it in whole or in part. If the concession is in fact modified or withdrawn, other interested countries may then withdraw or modify substantially equivalent concessions. The Agreement and its Schedules of tariff concessions will be put into effect provisionally on January 1, 1948 by Australia, the Belgium-Netherlands-Luxemburg Customs Union, Canada, France, the United Kingdom, and the United States, and by other participating countries as soon as they can comply with procedures required by their constitutions or laws. This must be done by June 30, 1948. Provisional application by the United States will be effected by Presidential proclamation under the Trade Agreements Act, as amended. The Agreement will enter definitely into force upon deposit with the Secretary General of the United Nations of formal acceptances on behalf of countries making up 85 per cent of the foreign trade of all negotiating countries as determined in an annex to the Agreement.

Pacific WORLD TRADE

WORLD TRADING PRACTICES DETAILED

A publication which should be of unusual interest to businessmen and others seeking information on accepted methods and practices in buying or selling abroad has been issued by the National Chamber's Foreign Commerce Department under the title, *Doing Import and Export Business.*

The 140-page booklet provides those without experience in foreign trading a concise and systematic discussion of the principles, practices, techniques, and problems of importing and exporting.

The document is intended as a practical introductory guide for use primarily by manufacturers, wholesalers, and retailers, without previous experience in importing, who wish to import foreign supplies, and by manufacturing companies or other producers who contemplate starting export business.

It will serve likewise the interests of students of the practical aspects of foreign trading and will be of value for review by many persons employed in special positions in import or export businesses.

Single copies are available from the Foreign Commerce Department at $1.00 each. Bulk lots of 25 or more to the same address may be obtained at a discount of 20 per cent.

NETHERLANDS INDIES EXPORTS

Rubber

Exports of rubber from the Netherlands Indies have been increasing "considerably" according to a government report based on findings in recently recovered areas, and made public by the Netherlands Information Bureau's western division.

Rubber production in Java and Sumatra is expected to reach eight to nine thousand tons monthly in the first quarter of 1948, the report indicated. Production for the first half of 1947 amounted to 600 tons monthly, with increases starting in July. By next year's second quarter rubber exports will be on the gradual increase.

The report listed other important commodities as follows:

Palm Oil

Production of palm oil has not begun as yet. There are some 118,600 acres of the palm oil region under Dutch control; of this about half, or 61,775 acres, have been brought under a management representing seven estates. Of the 19 palm oil factories in this area before the war, six are reported as more or less seriously damaged. Nevertheless, according to the government report, the production forecast for 1948 is estimated at 80,000 tons; for 1949, 150,000 tons, and for 1950, 250,000 tons.

Tea

Present tea production in Java and Sumatra amounts to a few hundred tons monthly, with some twenty-five to thirty per cent of the prewar acreage gone. Future tea export is estimated, according to the report, at 500 tons for January, 1948, with gradual increases throughout the year for a total export of 20,000 tons. Exports for 1949 were estimated at 30,000 tons, and for 1950, 60,000 tons.

Sugar

The amount of sugar stocks recovered in Eastern Java were set at 142,000 tons. New crops have been started.

Tobacco

It will be late 1948 or early 1949 before the new crop of high-grade Sumatra wrapper tobacco will reach the market, according to the report. While the current crop is estimated at 15,000 bales, the next crop it is believed will reach a total of 50,000 bales. Java wrapper and filler tobacco crops for 1948 are estimated at 10,000 tons. This year's crop of native tobacco in Eastern Java is expected to be very low, with present stocks amounting to approximately 1,500 tons.

For years the production of estate tobacco in Eastern Java has been neglected, the report said, although installations and godowns (warehouses) are reported to be in reasonably good condition for the most part. Stocks of estate tobacco around Djember, important tobacco growing area in Eastern Java, are believed to be approximately 1,800 tons.

Sisal and Abaca Fibers

Exports from the Indies of sisal and abaca fibers will be around 7,000 to 8,000 tons in 1948, it is believed. They have been estimated at 20,000 tons for 1949 and for 1950 at 35,000 to 45,000 tons.

Sisal manufacturing installations on the East coast of Sumatra around Medan have suffered little damage, although sisal plantings have been very severely damaged. It is not expected that the region will produce crops to any great degree before 1950.

Meanwhile, abaca plantations in the Medan area were found in better condition, and it is believed that production of the fiber can be resumed to some extent in the near future.

Quinine

It is believed that quinine production will be back to prewar levels within eighteen months, since both plantations and installations producing cinchona are in good condition.

Tin

Before the war some twenty-five per cent of the world's tin was produced in the Netherlands East Indies. With dredging equipment almost wholly destroyed by the Japs, the rehabilitation of this industry will, nevertheless, be within eighty per cent of completion by the end of 1947, with the year's production estimated at 200,000 tons. Production estimates for 1948 have been set at 40,000 tons; 1949, 45,000 tons; 1950, 50,000 tons.

Kapok

Kapok exports for 1948 are estimated to range from 5,000 to 6,000 tons; for 1949, 6,000 to 10,000 tons; 1950, 10,000 to 12,000 tons. There are some 2,600 tons of the old crop recovered in East Java and Madura. The new 1947 crop is figured at 4,000 tons.

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FRANK FOISIE TELLS OF WATERFRONT PROBLEMS

At a recent meeting of the San Francisco Junior Chamber of Commerce World Trade Committee, Frank P. Foisie, president of the Waterfront Employers' Association, explained the relationship of waterfront problems to world trade. Shown above at the head table: Frank (bridegroom) Hooper, Bank of America; Wm. O'Donnell, United Air Lines; Frank P. (for pipe) Foisie; Herb Potter, Otis, McAllister & Co.; T. Douglas MacMullen, Pacific Marine Review.

AT THE JUNIOR WORLD TRADE MEETING

Left to right: John B. Harbell, Allan Eber, Professor M. R. Benedict, President Herbert Porter. Professor Benedict addressed the meeting on Agriculture and World Trade. His talk was summarized in the October Pacific Marine Review.

BANANA BOAT USES ATLAS PORTABLE CONVEYOR

PMR's staff photographer caught the good ship *Amapala* in dock down at Pier "A," Long Beach, and discovered the Southern Terminals Company using a very interesting method of unloading bananas from hold to freight car. The Atlas Welding & Mfg. Co., of Long Beach, manufacturers of conveyors, supplies a portable conveyor belt to remove the bananas at the rate of 32 carloads in 11 hours.

The *Amapala* is one of six banana boats owned by the Fuente Banana Company of Brownsville, Texas, Valentine Fuente, President. She is a converted Canadian corvette, a full reefer equipped with Freon-type refrigeration and reciprocating engines, twin screw and knocks off 17½ knots. She cruises at 14 knots enconomically.

The Fuente Banana Company operates out of Salina Cruz, Mexico, and makes the run in 11 days. These Mexican bananas are called the Chiapas Bananas, and are mighty tasty. The Fuente Company has only recently started this Pacific Coast run and their general agents are the Southern Terminals Company located in Long Beach.

Amapala with the Southern Terminals officials, captain, chief engineer, on the bridge on 8th run from Salina Cruz.

Pacific
WORLD
TRADE

WORLD TRADE DEPARTMENTS HAVE NEW TARIFF LISTS

A copy of the concessions, tariff reductions and analysis of trade agreements agreed upon by 23 nations at the Geneva conference, October 30, is available for reference purposes at the World Trade Departments of the San Francisco, Oakland and Los Angeles Chambers of Commerce.

Ono, coming into San Francisco with the Bagley, Craven and Helm.

TUG TOWS THREE DESTROYERS

A tow of unusual size and distance cleared the Golden Gate November 6 after a 21 day trip from Honolulu.

The Ono, one of two 516 ton tugs recently purchased by the Hawaiian Pineapple Company for its subsidiary Isleways, Ltd., brought in three crewless ex-Navy destroyers for scrapping at the Moore Drydock Company in Oakland.

Preparatory for towing to San Francisco, the vessels were placed in drydock at Honolulu for examination. At this time the main injection and overboard discharge valves for the main salt water circulating system were examined, closed tight and wired in a closed position. All other openings in the shell were closed by means of wooden plugs driven tight from the outside and shaved flush with shell plating or closed by means of bolted steel plates. The rudders were secured in a fixed position. The six propellers were removed from the vessels and secured on the main deck aft. The shell plating on the vessels was examined and considered as being in satisfactory condition for a tow. All openings in the shell plating above the water line, including port lights, were secured and made tight. Openings and exposed areas of main and forecastle decks were closed up and hose tested as necessary and proven tight. All openings in the main and forecastle decks located within the super structure were closed and made tight, and external bulkhead openings of superstructure were closed and made tight.

A considerable number of valves in various piping systems throughout each vessel had been removed. Watertight compartmentation below the main and forecastle decks was maintained by blocking all piping systems and closing all excess openings in bulkheads and decks. Loose gear and material throughout the vessels was secured or stowed as considered necessary.

Side lights and stern lights were installed and each light supplied with storage batteries of sufficient capacity to supply lights for 24 days towing time with continuous lighting.

The towing bridles for all three vessels are similar in arrangement. The vessels' chain was doubled, secured to the forward bitts and starboard, and extended to the after bitts port and starboard on forecastle deck as a preventer. This chain was secured to a 1½″ towing heart plate located approximately 10′ forward of the anchor windlass. The lead chain from the towing plate was 2½″ cast steel stud link chain, approximately 60′ in length. The heart plate was further secured by means of a single length of the vessels' anchor chain from the heart plate to the vertical anchor windlass capstan.

The three vessels were unmanned and were arranged and towed in tandem as follows:

The first vessel, *Bagley*—towed at 600′ on a 2″ 6 x 19 towing hawser secured to the lead chain with a 2¾″ shackle. This vessel was towed through from one drum of a dual drum towing engine.

The second vessel, *Craven*—towed at 1390′ on a 1¾″ 6 x 27 plow steel towing hawser. Secured to lead chain with a 2¾″ shackle. This vessel was towed from the second drum of the tug's dual drum towing engine.

The third vessel—*Helm*—towed at 2200′ on a 1½″ 6 x 37 plow steel hawser with a 2¾″ shackle to lead chain. This vessel was towed through from the towing bitts on the tug.

Towed with their rudders set, respectively, at amidships, 5 degrees left and 20 degrees left, the destroyers fanned out somewhat to the left and slowed the tow to an average of four knots for the voyage. They maintained this relative position throughout, Captain Bob Nakea reported, except in a heavy following sea, which on occasions set all three destroyers on the right rear

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Marine Insurance

The London Letter

By Our United Kingdom Correspondent

Hull Rates

WITH REGARD TO THE FUTURE of hull insurance rates, it would be difficult—although nothing is certain in this postwar world!—to put forward any argument in favor of any further all-round reduction in the cost of hull insurance. The cost of repairs has continued to rise, and this is contrary to the expectations with which generous concessions were made by underwriters in the immediate postwar revisions of the Joint Hull Understanding. Moreover, the monthly casualty lists now show a numerical increase of casualties compared with the same month in the previous 3 years. Unless all the signs are wrong, the probability is that hull insurance during 1948 will be carried on with little, if any, variation from the conditions of 1947.

Cargo Rates

The situation with regard to cargo rates is entirely dependent on the Combined Marine Surcharges. This, as is well known, is a much-debated issue, and none would care—or dare—to prophesy regarding the future of the measure.

Government Control

I have been asked for an indication of Government control of insurance in England. The only reliable pointer is that Sir Stafford Cripps, when introducing into Parliament the Assurance Companies Act of 1946, made it clear that, apart from a few cases relating to the Government's social insurance programme, the Government had no intention of interfering with private enterprise in insurance, which was so valuable an invisible export to the nation.

Healthy competition is one thing. Confused and contradictory underwriting is another.

The foregoing lines sum up the general opinion in United Kingdom marine insurance circles. There are a number of signs to indicate that the marine underwriting market, as a whole, is not pulling together—indeed, to quote one leading underwriter, "is not exercising the care and reasonable powers which lie within its grasp."

In the general confusion of this postwar world, marine insurance market difficulties increase and multiply. There is the problem of the rating of American steamers, Norwegian steamers, Dutch steamers; and long-drawn-out discussion on the retention or otherwise of the "C.M.S." (Combined Marine Surcharge); and the granting of attractive treaty terms to foreign nationalised insurance companies.

I recall that, following the 1914-18 war, there was a period of great activity, similar, in some respects, to those of the past years. Gradually, many sound principles were discarded, and in due course the market experienced a series of years when marine underwriting results were poor.

These and other matters may be viewed as pointing to a similar set of circumstances if the wise-heads in the industry do not find a way of getting together. Even international conferences, although useful in themselves, do not appear to be the solution to some of the many problems, a number of which are of a purely domestic character.

The situation now, as compared with the postwar world after World War I, is not quite the same for the reason that, whereas by 1920 the slump had begun to show unmistakable signs, values of hulls and commodities at the present time are still inclined to rise. Clearly, the 3 market agreements—Joint Hull, C.M.S. and War Rating—would seem to be necessary until the present general conditions show definite signs of settling down.

German Companies

Marine insurance business in Germany has not run unfavorably since the capitulation. Following the collapse of Hitler, marine underwriters in Germany realised that the level of costs for repairs would be of decisive importance for hull insurance as a "premier risk" insurance. As a precautionary measure, underwriters agreed with shipping companies on a form of settlement according to which underwriters were to bear the increase of costs up to 25 per cent only, the basis of comparison being prices ruling at the beginning of April, 1945. While, owing to circumstances, this special clause has not so far been brought into operation, it is available whenever required. In spite of price fixing, prices in Germany have shown marked increases, although they are not risen so much as was feared in some quarters. The agreement between underwriters and shipowners, however, will when the time comes for repairs to be executed to an extent greater than at present, be ready to be put into operation for the benefit of German marine insurance companies. News reaches me from an influential marine insurance source in Germany that, if German marine insurance is to play its part in the reconstruction of the postwar world, it is essential that all restrictions at present in force in connection with reinsurance should be dropped.

Italian Companies

Italy—to take another of the principal ex-enemy countries, so far as marine insurance business is concerned—is making rapid strides towards recovering her position in the shipping and marine insurance businesses. Marine insurance business in Italy was naturally disrupted by the war, and Italian underwriters had to start again almost from the beginning. It is to their credit that they wasted no time in setting about the grim business of restoring their shattered fortunes. Some companies have shown large increases in the amounts which they received in total marine insurance premiums. This growth in revenue is remarkable, even allowing for the changes in currency compared with prewar.

It must not be imagined, however, that there is going to be a boom in Italian marine insurance. There are many difficulties to overcome, and no salutary expectations should be entertained regarding the immediate outlook. But it is clear that the spirit of Italian marine insurance people stands high.

P. & O. Insurance

Interest has been aroused in shipping and marine insurance circles by the registration in London, with a capital of £500,000, of a new company called: "P. & O. Fund (Insurance), Limited." The objects of the company are to acquire the existing insurance business in all its branches now carried on by the Peninsular & Oriental Steam Navigation Company (more generally known as the "P. & O. Company"), and to carry on the business of marine, aviation and transit insurance business, etc. Directors of the P. & O. Company are directors of the new company, whose offices are also those of the famous P. & O. Company—namely, 122 Leadenhall Street, London, E.C.3.

Since the registration of the new company, the question has been asked whether the P. & O. Company was about to revert to the practice, abandoned many years ago, of insuring its fleet and the fleets of associated companies in a special insurance fund, and only placing the excess of a given amount on the higher valued vessels in the open market on "total loss only" conditions. It is learned, however, that this is not the Company's intention, but that the formation of the new company is only a domestic development intended to facilitate the carrying on of the insurance business of the P. & O. and associated lines without any alteration of existing practice—also, that there is no intention of reverting to the self-insurance scheme which, as indicated above, was abandoned some time ago.

Adelaide Star

The Maritime and Commercial Court in Copenhagen have given reserved judgment in the *Adelaide Star* case —the action brought by the Blue Star Line, Ltd., London, against the vessel's builders, Messrs Burmeister & Wain, and against the Danish Government and the Danish War Risks Insurance Office. The vessel, which was launched on 30th December, 1939, and was fitted-out when the Germans invaded Denmark, was subsequently taken over by the Germans, and was later lost in an Allied air attack. The Blue Star Line claimed from the builders 15,300,000k., the amount which, at the time of the issue of the writ, it would have cost to build a vessel similar to the *Adelaide Star*. There were alternative claims against the two other defendants. Giving judgment against the Blue Star Line, the Court ordered them to pay costs: 55,000k. (about £2,750) to Messrs. Burmeister & Wain; 30,000k. (£1,500) to the Danish Government; and 15,000k. (£750) to the War Risks Office.

The Continued Toll of Mines

Between 18th February, 1947, and 30th September, 1947, 12 vessels, each of over 500 tons gross, were lost, owing to mines or underwater explosions, and 19 were damaged. An additional 30 vessels of under 500 tons gross were lost or damaged, bringing the total number of vessels up to 61. These figures have been compiled by "Lloyd's List," and, therefore, are official.

With regard to the vessels over 500 tons gross, Norwegian-flag vessels are now the most numerous—7 vessels, 2 of which were lost. British vessels numbered 6, 1 being lost. Sweden is represented by 4 vessels. American ships were most numerous in an earlier list published last February. Now America has only 3 vessels in the list.

With regard to the areas in which mine casualties occurred, the majority—7 lost and 13 damaged—were in the North Sea and Baltic, including 3 lost and 6 damaged off the Dutch coast, 1 lost and 4 damaged in Danish waters, 2 lost and 1 damaged off the German coast, and 1 lost off Szczecin.

Admiralty Decisions

By HAROLD S. DOBBS *of San Francisco Bar*

Disrating of Master

ONLY ON RARE OCCASIONS in the past have admiralty courts been faced with problems incident to disrating of a master of a vessel. There are to the contrary an abundance of cases in which other members of a ship's crew, from the chief mate on down, have instituted actions for damages against vessels and their owners upon the ground that they have been improperly rated below the rating which they were originally hired to fill and for which they are qualified. The situation is slightly different in the case of a master in that he does not enjoy the right of *maritime lien* against the vessel, which under normal conditions is considered incidental to the claim of seamen other than masters.

A very interesting case was recently decided by the United States District Court for the Eastern District of South Carolina in a decision entitled *S. M. Feio v. The Brazilian Steamship Aguia, etc., Dantas and Cavalcante,* in which a former master who was the libelant in the instant cause, instituted an action both in rem (action against the ship) and in personam (action against an individual) for damages by prayer for wages, subsistence, etc., based upon the allegation that his status was reduced from master to mate after accepting an agreement to act as master. The facts themselves as well as the distinction between the various rights and liabilities of the respondents, provide a most unusual picture. The Brazilian steamship *Aguia* was the vessel involved and

Mr. Dantas was the vessel's owner. Mr. Cavalcante was the master named to succeed the libelant. The facts can be adequately summarized as follows:

Dantas employed the libelant in Brazil for a service that contemplated having libelant go to New York and there ship as mate of a vessel named the *Lucy*. Dantas and the libelant went to New York. After arriving in New York, Dantas decided not to purchase the *Lucy* which he had contemplated buying when he asked the libelant to go to New York. Dantas intended to use an American master to take the *Lucy* from New York to Brazil if he purchased her when he arrived in New York. In place of the *Lucy,* Dantas purchased the American ship subsequently given the name *Aguia,* then lying at Charleston, and it was thereupon agreed between Dantas and libelant that libelant should go to Charleston and assume command of the *Aguia* for the purpose of contemplating conversion repairs and taking the vessel to Brazil.

Some time after that, Dantas employed respondent Cavalcante in the capacity of master of the *Aguia.* It was firmly established that a contract existed between Dantas and libelant in which libelant was entitled to act as master of the *Aguia* and under which he was entitled to receive a stipulated monthly remuneration. Dantas told the libelant that he had changed his mind and would not permit him to act as master, but that he could remain aboard the vessel as mate. Libelant refused and left the ship. As a matter of fact, Dantas did not propose that the libelant's wages should be reduced from that specified in the contract simply because he would act as mate instead of master. Later, Captain Cavalcante, the new master, offered to allow libelant to return to Brazil on the *Aguia* in the capacity of a passenger, which offer was declined by libelant.

Libelant presented himself and testified as a witness at the trial and then announced that he had no other witnesses and closed his case. The claimants of the vessel thereupon challenged the jurisdiction of the court with reference to the in rem proceeding, basing the motion on libelant's testimony that he actually was in command of the ship as master, on the theory that by so acting, he failed to offer proof of the existence of a *maritime lien* to support the action. The law is well settled in the United States that no maritime lien exists in favor of a master for wages, and no law was brought to the court's attention to substantiate any lien for other claims of the master.

In the very famous case of *Norton, Assignee, v. Switzer,* decided by the United States Supreme Court, it was said:

> "*Seamen* have a maritime lien for their wages wherever the services may be rendered; but that just rule was never extended to the master, except in cases where the lien is created by statute."

There are no federal statutes creating such a lien. In view of the fact that no maritime lien exists, there is no right to proceed in rem (action against the ship). Therefore, the court recognized that it had no jurisdiction to enforce the claims of the libelant against the ship.

Following the aforementioned motion, the respondent Calvalcante, who you will recall was employed as master to succeed the libelant, moved to dismiss the libel as to him on the ground that no contractual obligation on his part to the libelant had been proved in the latter's testimony. The motion was granted.

The only claim that remained to be considered by the court was that made against Dantas, the owner of the vessel *in personam* for wages, travel expenses and subsistence. The court recognized that if the libelant was employed to command the *Aguia* on the voyage to Brazil, the action of Dantas, the owner, in putting a new man in command was a breach of the provisions of libelant's contract.

The court, however, went one step further and held that under such circumstances, a duty arose on the part of the libelant to minimize his damages by continuing to serve on the ship as mate at the same salary, and to claim only for such damage, if any, as might have resulted to him from sailing as mate rather than as master. He was not privileged to withdraw from the service of the ship because of his injured dignity and to refuse to render further service and at the same time to be paid wages for services not rendered. The failure of libelant to remain in the service of the ship in the capacity of mate, required the employment of another person in that capacity. The court held that the moment libelant left the ship and refused to continue to serve as mate, his employment terminated and he was entitled to no further wages from that date.

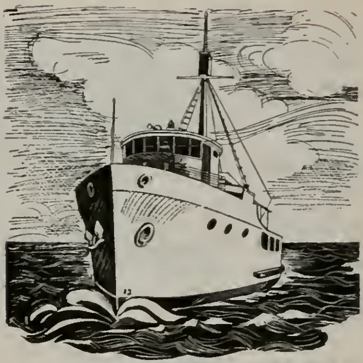
Even if libelant had been wrongfully discharged from the vessel, and even if the owner had refused to allow him to continue on board in any capacity, there is no theory of law that would permit the libelant to sit by in idleness for an indefinite time and insist upon the payment of his wages. The law has been well established to the effect that any servant following wrongful discharge, must bestir himself to seek other employment or otherwise minimize his damages. Therefore, if the libelant had been driven off the ship and not merely reduced in position of command, it would have been his duty either to sign as a mariner in some capacity on some other ship in Charleston, or to return to Brazil and seek other employment. Libelant's testimony is devoid of any evidence of his inability to obtain other employment or his inability to obtain return passage to Brazil and there seek to minimize his damages. Libelant's theory is one of "do nothing," upon which he claims wages should continue. Libelant failed to produce any sound principles of law to substantiate his claim based upon his allegation that he need not minimize the damages. Judgment was also rendered in favor of Dantas, the vessel's owner.

Psycho-Neurosis Without Physical Injury

Many of us are well aware of one of the more common principles of tort law which provides that one must prove that his injury proximately resulted or followed from the negligent acts or omissions of some other person or instrumentality in the hands of such person. Generally we assume, following such a showing,

(Please turn to page 80)

Coast COMMERCIAL CRAFT



The *Petaluma*

OF PETALUMA

The stern-wheel Steamboat *Petaluma* which recently hit an underwater obstacle while on its 36-mile trip from San Francisco to Petaluma will soon be back on its daily run.

Smith-Rice Company recently delivered the *Petaluma* to a local shipyard after raising her from the mud of Petaluma Creek.

One of the conditions laid down by the owners and underwriters in the contract covering the salvage of the vessel was that no undue stress or strains were to be created. This meant that the large Smith-Rice derrick barges could not be used to lift her to the surface and hold her while she was being pumped out. Under Smith-Rice's superintendent, George Mitchel, the *Petaluma's* hull was carefully plotted and powerful pumps were strategically located throughout the vessel's hull. After the hole in her hull had been patched and other openings in the hull and superstructure had been made watertight with temporary bulkheads, pumping operations began when the tides were at their lowest point, and the *Petaluma* soon was floating again.

The *Petaluma* is the last of the paddle wheel ships on the Bay. She was built in Benicia in 1914; however, her 63-year old engine was taken from the Steamer *Resolute,* and still in use are wooden pitmans.

The house organ of the Southern Pacific Railway which owns her, published a history of the *Petaluma*, and we quote from the issue printed the week the *Petaluma* sank:

"Black Point guards the creek or slough that pierces the marshes and meadows . . . In the next sixteen miles there are more than eighty changes of course . . . yes,

The steamer Petaluma on San Francisco Bay.

it's an art to keep the steamboat for Petaluma Town from coming to rest amid the cows and haystacks." The *Petaluma* came to rest in the river opposite the "haystacks."

Captain John Urton, skipper of the *Petaluma,* grew up on the "creek" where his father and mother had previously spent their life with the Steamer *Gold.* At present a son of Captain Urton is a member of the *Petaluma's* crew.

When repairs are completed, the Urtons will carry on with the "last of a heroic breed." Like the old lady who celebrated her hundredth birthday by sliding down the banister, the Steamer *Petaluma* still feels plenty frisky. Soon it will be: "She's sailing tonight at six, as usual."

OCEAN TOW CONVERTS FOUR NAVY YF BARGES

OCEAN TOW, INC. OF SEATTLE is the newest tug and barge concern on Puget Sound and Alaskan sea runs, and operates some of the most modern equipment on the Pacific Coast, with its newly-converted steel barges 260 feet long, 48 feet beam and 15 feet deep.

At a cost of over $100,000, Ocean Tow has completed the conversion of four surplus navy YF barges, acquired as surplus from the Maritime Commission. Two more of the craft will be converted at a later date.

Designed to conform to United States loadline requirements as specified by the American Bureau of Shipping, the barge modifications were made according to first class shipbuilding practice. The huge barges now are capable of carrying 4,000 measurement tons each of dry cargo with the same safety as a steamer. Sister ships, the barges are ship-form, so that they will handle well and safely at sea. They are of steel construction, all welded.

One of the major re-construction projects and one of the most unusual in west coast shipyards in recent months, the re-design especially protects general cargo. Original design was insufficient for the deep draft needed by Ocean Tow for the Gulf of Alaska routes. On a draft of 10′ 8″, each barge has a cargo capacity of 2,600 long tons in the more than 160,000 cubic feet of cargo space.

Conversion of the craft to Ocean Tow needs covered five principal phases:

To strengthen the double-bottom framing for maximum draft, approximately 650 angle-iron stiffeners were set in between the longitudinals and in the turn of the bilge.

To meet merchant vessel standards, the cargo hatch beams were strengthened for protection against the sea and to allow for carriage of heavy deck loads on top of the hatch covers. Hatches were completely refitted.

Ventilators, exterior cargo doors and airpipes were revamped to comply with loadline regulations. Overboard discharges and suctions no longer of use were closed.

Miscellaneous structural damage incidental to war service was repaired, particularly in the fore-part of the bottoms.

Scaling and painting completed the project.

Built in 1945 as YF barges for the U. S. Navy, two of the barges were constructed by the Willamette Iron and Steel Works of Portland, Oregon; one by the Cramp Shipbuilding Company, Philadelphia, Penn.; and one by the Nashville Bridge Company, Nashville, Tennessee.

Each barge has a steel deckhouse superstructure covering the greater part of the length. The top-gallant forecastle is 8 feet high and extends 26 feet abaft the stem with the foercastle deck sloping down as a ramp for 24 additional feet to a point where it intersects the upper deck. Barges are longitudinally framed with transverses placed on 16-foot centers through the middle part of the vessel, closer at bow and stern. Maximum spacing of watertight bulkheads is 48 feet, which insures their ability to sustain severe damage and still remain afloat.

The double hulls provide insulation against extreme temperatures and can be used for movement of liquids in bulk. Loading and discharge are by shoreside cranes.

Conversion design was prepared by Carl J. Nordstrom,

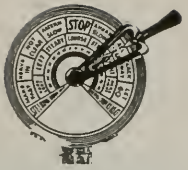
(Please turn to page 92)

Moulded covered steel barges, 260 feet long, 48 feet beam are used by Ocean Tow.

Motive power for Ocean Tow barges is furnished by tugs 126 feet long, equipped with latest navigation aids.

Steady as you go!

KNOWLEDGE IS THE STRAIGHT COURSE TO ADVANCEMENT



A Department for Deck Officers

by "The Skipper"

Questions Welcomed. Just Address "The Skipper," Pacific Marine Review, 500 Sansome St., San Francisco, California

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THE MAGNETIC COMPASS

Part I

Construction of Binnacle and Compass

Most Deck Officers are required to answer numerous questions pertaining to magnetism and compass compensation while taking their license examinations. The speed with which this knowledge departs from the mind, once the license is obtained, is often amazing. Test yourself and see. Ask yourself the following questions and check your answers in a reliable text book.

1. If, while compensating a compass, your vessel heading East, it was determined that there was 10° Easterly deviation, what force would be causing this deviation?
2. How would you remove this error?
3. How would you test your compass for moment and sensibility?
4. How would you check to see whether the compass was centered in the Binnacle?
5. Where is the force of the vertical component of the Earth's total force the greatest?
6. How would you determine if the magnets of your compass were weak, or if the pivot point was worn or blunt, or possibly the jewel cracked?

If you are able to answer these questions correctly, you are among those fortunate individuals who are able to retain knowledge which is seldom used, and a logical question would be—if this information is so seldom used, why bother retaining it? The answer is simple. A competent deck officer thus proves his efficiency by being able to perform those duties which may on occasion be reasonably expected of him.

It is true that the use of gyro compasses aboard merchant ships has to a great extent reduced the amount of faith and dependence that we need to place on the Magnetic Compass, and due to the advantages the gyro compass offers, we are prone to neglect the magnetic compass and navigate almost entirely by gyro. However, the magnetic compasses are still part of standard equipment and are used daily in comparisons. They are always there to rely on in case of some power or mechanical failure. There are no power failures in the Earth's magnetic lines of force.

Due to possibly any number of circumstances or conditions, the magnetic compass receives very little care or attention on perhaps the greater portion of the vessels sailing today. One of these causes, I'm sure, is the fact that many licensed officers are not too familiar with the parts, construction, installation, and compensation of the magnetic compass. As a result, they are rather hesitant to attempt to do anything but leave it alone, which is a very good idea in such cases.

This article, and possibly one or two succeeding it, is intended to explain away in simple words and manner, the mysteries of the magnetic compass and bring about the realization that it is a very dependable instrument which affords very little trouble to the officer who knows and understands it.

In order to understand more thoroughly the workings of the magnetic compass, perhaps we should first make a study of its parts, construction and installation. Since most of the installations of the magnetic compass on vessels of today's merchant fleet are of the liquid type, we will devote most of our time to that type after briefly explaining the advantages and disadvantages of the dry card type.

The dry card or Lord Kelvin type compass consists of a circular card of strong paper, usually parchment stiffened at the outer edge by a thin aluminum ring. The inner edge is perforated with 32 holes to which are attached silk threads which are in turn attached to a light aluminum boss. In the center of the boss, a sapphire jewel is secured which forms the bearing surface for the iridium-tipped pivot. The eight magnets of small wire needles vary in length from 2 to 3¼ inches and are aligned with the North-South axis of the card. They are secured to the card by means of two parallel silk threads attached to the aluminum ring on the under side of the outer edge of the card.

The advantages of this type compass are:

1. It is a highly sensitive instrument.

2. It requires less powerful direction-seeking magnets due to the fact that it has less friction to overcome in seeking its direction.

3. It is easier to compensate because the less powerful magnets do not induce as much magnetism into the soft iron correctors used in compensation.

The disadvantage of the dry card type compass, and outweighing all of its advantages, is that it is unsteady in a seaway or when subjected to shock such as gunfire, etc., thus causing it to be less efficient for navigational purposes.

The liquid or Navy type compass has the advantage of being more steady, due to the retardation of the swinging of the card by the liquid in the bowl. This steadiness makes the liquid type more preferable for navigational purposes even though it has the disadvantage of requiring more powerful direction-seeking magnets which induce a certain amount of magnetism into the soft iron correctors, thus making compensation more difficult. Therefore, we shall concentrate our study on this type compass.

Parts of the Standard 7½ Inch Liquid Compass

1. The *Gimbal Ring* is a ring of non-magnetic material which encircles the compass, fitted with two knife edges 180° apart which rest in wyes (V-shaped bearings) on the inner side of the compass chamber of the binnacle. The ring is also equipped with wyes 90° from the knife edges of the ring in which the knife edges of the compass bowl rest. Centered in the wyes are adjusting screw studs with locking nuts on the outside which are used to center the compass bowl in the binnacle. The purpose of this Gimbal Ring is to allow the compass a certain amount of freedom in a horizontal plane around its fore and aft and athwartships axes.

2. The *Compass Bowl* is made of cast bronze and is weighted at the bottom with a lead weight thus lowering the center of gravity and keeping the bowl more steady in a horizontal plane. Attached to the bowl at the base is an expansion chamber of elastic metal which is connected directly to the bowl by two small holes which allow circulation of the liquid between the bowl and the expansion chamber as is necessitated by the expansion and contraction of the liquid in the bowl due to temperature changes.

On the illuminated card type compass a pivot is mounted on a crossbar 90° from the lubbers line as near the glass bottom as possible. This pivot extends upward and is tipped with a moderately sharp iridium tip. The pivot is fitted with adjusting screws for centering. The non-illuminated card type has the pivot mounted in the bottom of the bowl. The bowl is painted white on the inner surface with a paint which is insoluble in the liquid mixture. Two lubber lines of black on white enameled plates are mounted 180° apart on the upper inner side of the bowl by means of small brass screws. A rubber packing, which is a ring of round rubber, fits in a groove at the top of the bowl. The glass cover fits inside the rubber packing. A brass packing ring fits on the top of the rubber packing thus flattening and spreading the packing so that it seals against the glass cover holding it secure and making the chamber watertight. This brass packing is held in position by brass screw studs. A brass screw filling plug or stud fits in a threaded hole in the side of the bowl which is used for filling the bowl with the liquid.

3. The *Card Assembly* consists of a card of tinned brass 7½ inches in diameter,' a spheroidal air vessel or float chamber which is mounted in the center of the card to buoy the weight of the card assembly, allowing a pressure of only 60 to 90 grains on the pivot at 60° F. temperature while the entire card assembly weighs 3060 grains, and a sapphire bearing secured in a pivot cap which is mounted in a conical opening on the under side of the air vessel. Four magnets, usually cylindrical bundles of highly magnetized steel wires sealed in a waterproof cylinder of tinned brass, are mounted on the under side of the air vessel parallel to the North-South axis of the card. Two of these magnets are 5¼ inches long, their ends on chords (30° apart) of circles passing through their extremities. The other two are 4⅜ inches in length with their ends on chords (about 90° apart) of a circle passing through their extremities. The horizontal plane of these magnets is ¾ inch below the top of the pivot.

The Parts of the Navy Type Standard Binnacle and Attachments

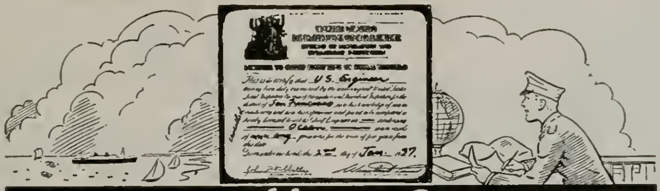
The Binnacle is a device for supporting the compass and its compensating equipment. The binnacle stand is usually a single casting of non-magnetic material consisting of four parts,—namely, the *base*, the *pedestal*, the *magnet chamber* and the *compass chamber*. The *base* is circular with 12 equally-spaced holes for securing to the deck, two of which are in the exact fore and aft line of the binnacle and are marked with accurate fore and aft markings. The *pedestal* is tubular in design and serves as a support for the magnet chamber. The lower end of the heeling magnet tube extends down in the center of this pedestal. The *magnet chamber* is conical in shape and is equipped with a laterally sliding door which provides access to the mechanism within. This mechanism consists of the following:

1. A tube for the heeling magnet which is centered vertically and extends from the bottom of the compass chamber to the bottom of the pedestal. The tube is graduated in tenths of inch markings and slotted so that the heeling magnet is visible for recording the position of the heeling magnet.

2. A fairlead and reel for the chain which supports the heeling magnet.

3. Sets of trays, of six to eight horizontal tubes, each mounted fore and aft and athwartship which act

(Please turn to page 88)



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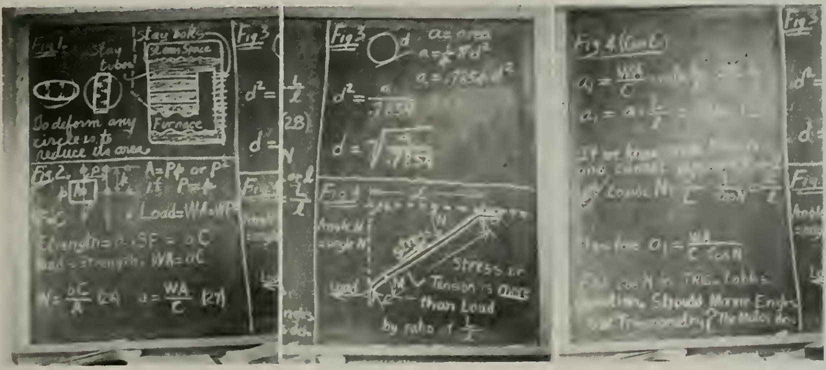


Blackboard figures 1 to 3 mentioned in the text.

Stays for Flat Surfaces of Pressure Vessels

MANY JUNIOR ENGINEERS FAIL to understand the fundamental reason for the use of stays in boiler construction. Modern boilers aboard ship are of the water tube class and have few, if any, stay bolts or stay tubes. Yet nearly every license examination contains at least one question on stays.

A fundamental equation (statement of a truth) in physics is that a body under stress of any kind tends to yield in any and all directions that will ease off the stress, or make the stress less difficult to bear. Fig. 1 shows an ellipse and a rectangle with pressure in the inside, and indicates that the surfaces tend to change shape approaching a cylinder or sphere. A proposition in geometry states that a circle will contain more area for a given length of enclosing line than any other figure. The same is true for a sphere with respect to the area of the surface. Therefore, with internal pressure, all other shapes tend to become cylindrical or spherical.

The Scotch marine boiler at one time was very popular aboard ship. It is a fire tube type, with all fire side surfaces surrounded with water, and needs very little brick. But as indicated in Fig. 1, the flue involved large surfaces which were either flat or contoured to other than a cylindrical shape. The modern locomotive boiler has many square feet of flat stayed surface. Therefore all textbooks and classes of instruction on boilers cover stays! They are also extensively covered in the Coast Guard Marine Engineering Regulations, both in the old section for ships built prior to 1936 (page F-196), and in the new section for ships built since that date (page F-81).

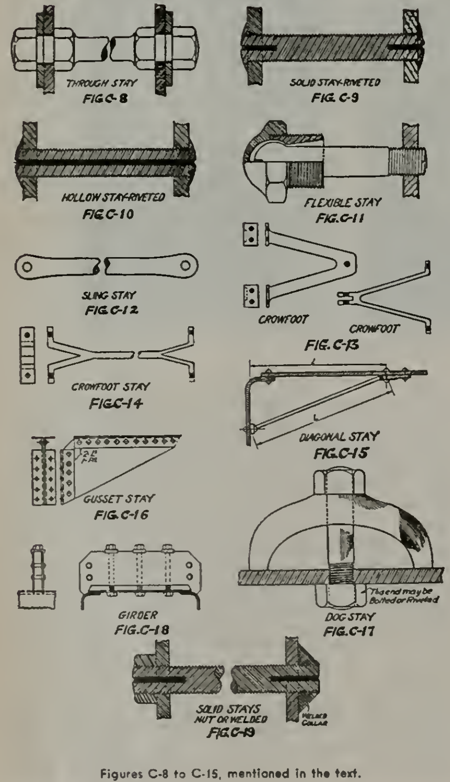
Many types of stays are covered in several combinations, some of them shown in sketches on page F-83, and shown in part herewith as Fig. C. The young engineer would do well to familiarize himself with these stays and their corresponding names as he may be called upon to sketch one of them sometime. While the mathematics of the stay may be quite simple, it may involve square root.

As we have done heretofore, we will approach the calculation of the stay from the logical standpoint that STRENGTH MUST EQUAL LOAD. The load on the plate supported by the stay is the pressure W psi (pounds per square inch). See Fig. 2 in the blackboard sketches. The area on which this pressure weighs is P x p, or the product of the pitch of the stays in each direction. Call this area A. It is not quite clear that one bolt supports this area until we consider the area made up of center lines drawn *between* the bolts instead of *through* them. Or we may prefer to think that each corner of the area is supported by one-quarter of the bolt at that corner. Four bolts, each contributing one-quarter, makes one bolt per area.

W equals pressure psi.

A equals area supported by the bolt.

a equals the net area of the bolt square inches. (Note that the Regulations, page F-84, shows this as inches in error.)



Figures C-8 to C-15, mentioned in the text.

S equals tensile strength of steel. F equals factor of safety.

C. equals SxF, or a constant tabulated in the regulations for different steels and conditions.

Equating strength and load, we arrive at the formula shown in the Regulations. Transposition gives us the value of a or W. To obtain the diameter of the stay bolt, we must proceed as shown in Fig. 3. This requires that we extract the square root of a number. This process, with the logic and procedure, will be discussed in the January issue.

The reason why the Regulations give us a constant C in the stay bolt problem instead of a tensile strength S and a safety factory F, as is the case in the boiler shell and riveted joint problems, is that the S of boiler plate is stamped on the plate at one corner of the boiler where it can be read off and used. It is the value determined by actual test of a sample of that particular steel plate at the factory, and observed by a representative of the Coast Guard. This tested value of S for the steel of the stay bolts is more difficult to obtain as the steel from which it is made is not identified at the factory making the bolt. Nor could it be easily stamped on the bolts. Thus the Coast Guard increases the safety factor somewhat and allows us a figure depending only on the general classification of the steel and the location and type of bolt. To illustrate: C for a solid steel bolt is 10,000 and for a tensile strength of, say, 55,000 it means a safety factor of 5.5.

The case of the diagonal stay, Fig. C-15, will be encountered by Marine Engineers because it is a test of their reasoning power and logic, as well as an excellent sample of the well-known problem in mechanics, that the stress to support a given load increases when the line along which the stress is acting is not the same line along which the load would move if not supported by the stress member. See Fig. 4. Here we allow a_1 (read as "a sub one") to be the stress in the diagonal stay. It is more than the load on the plate as calculated by formula (27) Fig. 2. The ratio by which this stress exceeds the load is the ratio of the length L divided by l. So therefore we obtain a_1 by the product of a x L/l, which is formula (28) in the Regulations. (l is small l.)

This effect of an angle on our calculations occurs so frequently that engineers and mathematicians have calculated the ratios of all angles and tabulated them for ready use. These tables are called the Trigonometry Tables from the name "tri," meaning "three," for the three sides or angles of the triangle. Their use here is also shown in Fig. 4. Angle M is the angle between the load action and stress action lines. Angle N equals this angle M. The table of Cosines gives the ratio of 1/L, (side adjacent to the angle divided by the hypotenuse of the right triangle.) One divided by this ratio will give the inverse and desired ratio. Thus, a_1 can be calculated by looking up this ratio in the tables if the angle is known instead of the length l and L. The Regulations have very carefully avoided use of trigonometry, and perhaps wisely so, as many do not use these tables if direct measurements are available.

Our next article will discuss square root and its use.

On the Ways

New Construction - Reconditioning - Repairs

BETHLEHEM'S DRYDOCK'S BUSY

IN A SCENE REMINISCENT of war days, Bethlehem Steel Company's San Francisco Yard recently had a damaged ship on each of its four floating drydocks.

The *Sparrows Point,* a tanker built at Bethlehem-Sparrows Point Shipyard, Inc., in 1942, and recently damaged in a collision with the *Manx Fisher,* a Canadian Liberty Ship, off Point Sur on the Monterey Coast, was in for damage survey. This vessel was named after the yard which built her as a tribute, on behalf of the Maritime Commission, to the patriotic efforts of the employees of the yard in carrying out a highly successful scrap salvage campaign and for an outstanding record in War Bond purchases.

Also on drydock for survey was the *George Boutwell,* a Liberty ship which recently suffered grounding damage in the Orient and on which temporary bow repairs had been made there; and the *Escambia,* a 10,000 HP tanker built by Marinship and converted to a Navy Oiler prior to completion. During the war she was operated by the Navy, and is now being reactivated by the Maritime Commission as part of the government's recent tanker program. She is being drydocked for survey and underwater repairs to existing bottom damage.

The *Mission Soledad,* included in the group of four damaged ships, is a 10,000 HP tanker operated by the Maritime Commission during the war, which is being reactivated by the Navy as part of the tanker program. She is on drydock for routine repairs and survey of extensive bottom damage.

Above: Close-up view of Sparrows Point's damaged starboard bow. Below: The Escambia on drydock.

Right: Mission Soledad. The smoky haze in right foreground is result of sandblasting hull. Far right: Close-up bow view of the George S. Boutwell.

TWO BIG CONVERSIONS

Patuxent at Everett

A reconversion job recently got under way at the Everett Pacific Shipbuilding and Dry Dock Company Yard in Everett, Washington, with the arrival of the *Patuxent* from San Francisco. The work was awarded to Everett Pacific by the Maritime Commission on a low bid of $331,311. Other bids were: Moore Dry Dock Co., San Francisco, $363,179; Bethlehem Shipbuilding Division, Alameda, $398,920; Todd Shipyards Corp., Los Angeles, $490,950. Bids were opened in San Francisco and the vessel towed to Everett from that port by Foss Launch and Tug Co.


Left to right: Patuxent, sold by Maritime Commission to Sabine Transportation Co.; Ticonderoga, of the Keystone Shipping Company; Coastal Rambler, of Alaska Steamship Company; Housatonic, purchased from Maritime Commission by Standard Oil of New Jersey (to be renamed Esso Bethlehem); ahead of Housatonic, the freighter Skookum Chief, of Puget Sound Freight Lines.

The *Patuxent* has been purchased from the Maritime Commission by the Sabine Transportation Co., Port Arthur, Texas, and will be used with a fleet of seven other tankers in transporting bulk oils from ports along the Gulf of Mexico to the Atlantic Seaboard.

The extensive repair and reconversion, which will not be completed until about the middle of December, includes all work necessary to restore the vessel to her original class as a commercial tanker. A spectacular item of work in the specifications is the complete renewal of the upper bow, including shell plating and decks, from the top of the peak tank to the main deck. This damage is the result of a casualty suffered during the war which was only temporarily repaired. In addition, all Navy-installed defense features and cargo piping are to be removed and commercial piping is to be installed; all Navy crew's quarters are to be removed and commercial quarters installed; the spar deck (used for deck cargo by the Navy) is to be removed; every item of machinery in the ship is to be overhauled; and the vessel will receive a new coat of paint from the keel to the top masts to replace her wartime gray.

Originally built by the Sun Shipbuilding and Dry Dock Company in 1942 for Keystone Tankship Corp. as the *Emmkay*, the vessel was requisitioned by the Maritime Commission for use by the Navy, and was commissioned as the *Patuxent*, AO-44, in October, 1942. From then until late 1945 she was actively engaged with either Admiral Halsey's third fleet or Admiral Spruence's fifth fleet in the prosecution of the war. In addition to routine fleet fueling operations throughout the forward Pacific areas, the *Patuxent* was active in the campaigns involving the capture and defense of Guadalcanal, the consolidation of the southern Solomons, the Marianas, taking and holding of Saipan and Tinian, the first and second battles of the Philippines, Iwo Jima and Okinawa operations and finally in the attack on Japan proper and as part of the occupation force in Tokyo harbor.

Among other hazards, the *Patuxent* survived the now famous typhoon of December, 1944, said to be the worst storm in naval history when wind velocities were reported to reach 115 knots.

The *Patuxent* was decommissioned by the Navy in February, 1946, and returned to the Maritime Commission for disposition. Following completion of her reconversion, the vessel will go into active service for the first time since shortly after the close of the war and into commercial service for the first time in her career.

Ainsworth at Bethlehem

The *Fred C. Ainsworth*, 12,097-ton C-3 type U. S. Army transport, is at Bethlehem Steel's San Francisco Yard for the second Army modernization conversion job of its type on the Coast since the war. Bethlehem is currently performing a similar job on another Army transport, the *David C. Shanks*. Extent of the work required is seen in the fact that the transport will be in Bethlehem's Yard until next summer.


U.S.A.T. Fred C. Ainsworth.

Major basic items for the conversion include changes and improvements in the fire control and ventilation systems, new furniture, fixtures and fittings throughout the ship, a new aluminum stack which will be built by the Yard, and the installation of eight new motor drive topping lift winches. New hospital equipment and a new operating room, dispensary, pharmacy, diet kitchen are also included.

In addition to the large amount of work required for the conversion on the *Ainsworth*, Bethlehem will perform voyage repairs which will include lifting turbines for inspection, inspecting reduction gear teeth and overhauling auxiliary motors. The interior of the ship will be painted throughout.

Running Lights

THOMAS
JAMES
COKELY,
Vice President
in charge of
Operations
of
American
President Lines

THE WOMEN'S ORGANIZATION ACHIEVES NATIONAL STATURE

Left to Right: Miss Alma Canavan of Pacific Marine Review; Mrs. McKinley; Mrs. Harry Parsons; Lloyd S. Fleming; Mrs. Johnston.

The November meeting of the Women's Organization for the American Merchant Marine brought announcement of new preferment for San Francisco's members at the New York convention to which Mrs. Robert Eastman and Mrs. Frazer Bailey were delegates.

Mrs. Eugene Hoffman was elected national treasurer and Mrs. Harry Parsons, regional vice president. President Mrs. John Johnston and vice president Mrs. Alfred Pittman were elected to the national board.

Guest speaker at the San Francisco meeting was Lloyd Fleming, Pacific Coast Director for the Maritime Commission, who delivered an outstanding address on "Our Merchant Marine as of Today." The address was outstanding because of the amount of authoritative information it contained, and also for the speaker's facility in answering questions. Speakers are sometimes at a loss when the question part of the program arrives, but not Lloyd. He asked the questions. Some of those questions and the very important answers follow:

Q. We had a big fleet on VJ-Day. To a large extent it represents the total of all vessels built. How big, in numbers, was the merchant fleet?

A. All told, American shipyards turned out some 5500 vessels during the war. Those 5500 ships included Liberty ships, Victory ships, tankers, as well as merchant auxiliary types for the Army and Navy. This does not include LSTs or other landing craft, or combat type vessels, which were built by the Navy.

Q. How many long range cargo vessels were completed during the war period?

A. As previously mentioned, the Maritime Commission embarked on a long range construction program in 1937—calling for the construction of 50 vessels a year for ten years. By the war end, nearly 500 of these standard commercial, high speed cargo ships were in operation—some were refrigerated vessels—others were combination passenger and cargo type vesseles. In other words, compared with our mass-produced Liberty and Victory type ships, those commercial cargo ships were tailor-made vessels. Most of these vessels, for war purposes, were converted to baby flat tops, troopers, etc.

Q. How many of our ships have we sold?

A. Congress enacted the Merchant Ship Sales Act of 1946, a little over a year ago. There were originally in excess of 4000 ships available for disposal under the terms of this Act. There has been sold to date, approximately 1500 ships. American companies have bought about 500 of them—however, as preference purchasers under the Act, American buyers have purchased the best types of ships, leaving the less desirable types for foreigners.

Q. Can foreign flag operators charter our surplus vessels?

(Please turn to page 87)

Mrs. Johnston

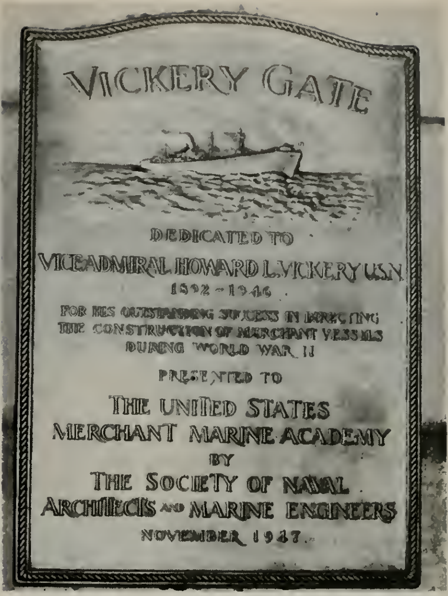
Mrs. Hoffman

Mrs. Parsons

VICKERY GATE

At The

MERCHANT MARINE ACADEMY



Bronze plaque presented to the Merchant Marine Academy at Kings Point, Long Island, the 15th of November by the Society of Naval Architects and Marine Engineers. The plaque is dedicated to Vice-Admiral Howard L. Vickery, USN.

On November 15, a large delegation of members of the Society of Naval Architects and Marine Engineers attended the unveiling of a bronze plaque given in memory of the late Vice Admiral Howard L. Vickery, U. S. N. The plaque is now mounted on the Vickery Gate at the entrance to the school grounds of the United States Merchant Marine Academy, Kings Point, Long Island, N. Y. The Society presented this plaque to the Academy as a means of honoring Admiral Vickery for his outstanding success in directing the construction of merchant vessels in World War II while a member of the Maritime Commission.

The dedication was participated in by Vice Admiral Emory S. Land, U. S. N. (Retd.); Vice Admiral Edward L. Cochrane, U. S. N. (Retd.), President of the Society; and Rear Admiral Richard R. McNulty, U. S. M. S., Superintendent of the Academy. Mrs. Vickery and her immediate family were present.

After the presentation and dedication, a review and parade by the regiment of Cadet-Midshipmen was held, followed by a buffet luncheon for the members tendered by the Superintendent. Members also made a tour of the grounds and inspected the school facilities.

FOLLOWING THE DEDICATION, this group of notables was snapped at the buffet luncheon. Left to right: Carl Flesher, general sales manager, Condenser Service Corp.; J. Salton, William S. Newell, Chairman, Bath Iron Works; Miss Irene Rong, of U. S. Maritime Commission and formerly confidential asst. to Admiral Vickery; James S. Hines, publisher, Pacific Marine Review; Mrs. James S. Hines; M. J. Ryan, Naval Architect, of San Francisco. Mr. Newell's Bath Iron Works built the Morgan yacht Corsair, recently featured on these pages, and Mr. Ryan was Naval architect for the conversion to cruise service.

W. M. Laughton (left), District General Manager of Bethlehem's West Coast Yards, and Rear Admiral D. B. Beary, Commandant of the Twelfth Naval District.

Citations at Bethlehem

On OCTOBER 24TH, W. M. Laughton, District General Manager of Bethlehem Steel Company's West Coast Yards was presented with facsimiles of the Presidential Unit Citation awarded five destroyers built in the company's San Francisco Yard. The presentation was made by Rear Admiral Donald B. Beary, Commandant of the Twelfth Naval District, in a brief ceremony held at the yard.

In making the presentation, Rear Admiral Beary emphasized the role of industry, its importance in national security, and the Navy's recognition of the outstanding contribution made by Bethlehem's San Francisco Yard during World War II.

The five Bethlehem-built ships that received the highest award the President can bestow, are the *Heerman*. *Hoel, Laffey*. *Maury* and the *England*. The *Laffey* was lost in the critical battle of Guadalcanal when she went down fiercely defending the cruiser *San Francisco* and the other cruisers of Admiral Dan Calahan.

The *Heerman* and *Hoel* were honored as a result of participating in the battle of Samar as a part of Task Unit 77.4.3. In one of the most glorious actions ever recorded in naval history, the unit charged Japanese battleships to the range of their destruction, protecting overpowered carriers in what amounted to a sacrificial action.

The *Maury* operated continuously in the most advanced areas from the commencement of hostilities. Against fierce Jap resistance, she attacked day and night, frustrating many enemy attempts to reinforce his garrisons, and furnishing powerful support for landing operations.

The *England* received the Presidential Citation because of an outstanding successful record. In a sustained series of attacks, she destroyed six enemy submarines within a period of twelve days. By inflicting this heavy loss on the Japanese, the *England* contributed substantially to the undetected and unmolested advances of our fleet which resulted in the seizure of the Marianas Islands.

The San Francisco Yard presentation was preceded, the day before, by a similar presentation at Bethlehem's San Pedro Yard, where facsimiles of Presidential Unit Citations awarded to three destroyers built by that yard were presented to W. A. Harrington, Assistant Manager, by Admiral Wynkoop, Senior Officer in Charge of the Terminal Island Shipyard.

The three destroyers cited were the *Cowell,* which played an important part in the softening-up bombardments at Iwo Jima in 1944; the *Hugh W. Hadley,* which bagged 23 Jap planes in a one and one-half hour battle off Okinawa; and the *Aaron Ward* which, in action off Okinawa, survived six suicide plane hits.

Dick Johnstone, of Toumey Electric & Engineering Company.

Dick Johnstone to Represent Toumey Electric & Engineering

EARLIER THIS YEAR, there was a reunion at the Toumey Electric and Engineering Company's office, according to Harry C. Toumey, it marked the return of an old timer to the waterfront. An old timer who remembered well Broadway Wharf, headquarters of the old Pacific Coast Steamship Company, the Pacific Mail, the radio station on Telegraph Hill—a pioneer wireless operator in the days of the original *Lurline, Alameda* and *Mariposa.*

Before Pearl Harbor, Dick Johnstone was outside man for Toumey, covering the waterfront, and was recalled into active service with orders to report to Washington, D. C. Several months later he was assigned to one of the largest Naval ammunition depots in the United States at Hawthorne, Nevada, where he served the entire four and one-half years, holding four offices with the rank of Commander.

Commander Johnstone acted as Communication Officer, Housing Officer, Security Officer (Military Chief of Police) and Airport Officer, under Captain F. A. L. Vossler, former Superintendent of the Naval Academy, and later skipper of the *North Hampton.* The 400 square mile depot with its wartime population of some 12,000 persons presented a vast assortment of problems for each of Johnstone's four departments.

Johnstone will now represent Toumey, calling on steamship companies, fishing craft and pleasure craft, and with the benefit of long waterfront affiliation and experience will aim to serve well those who require the varied services available at the Toumey Electric and Engineering Company.

R. Stanton Richter, of Pittsburgh Plate Glass Company.

Pittsburgh Plate Glass Appointments

Appointment of W. Ray Culp as manager of Industrial Sales, Pacific Coast, for the Paint Division of Pittsburgh Plate Glass Company, has been announced by Herschel E. Post, General Sales Manager of Industrial Finishes for the company. Mr. Culp succeeds R. Stanton Richter, who will serve the West Coast area as a sales representative specializing in Automobile Production Finishes.

Mr Culp has been associated with Pittsburgh Plate Glass Company's Paint Division since 1935, serving in branches at Fresno, Sacramento and Oakland. As Manager of Industrial Sales, his headquarters will be 7412 Maie Avenue, Los Angeles.

Mr. Richter has been associated with Pittsburgh Plate Glass for 27 years, serving at Denver, New York and San Francisco prior to his appointment as Manager of Industrial Sales, Pacific Coast during 1940.

Groves to Stock Corning

The Frank Groves Company, 444 Brannan Street, has been appointed one of twelve national stock distributors for the entire line of Corning and Pyrex gauge glasses by the Corning Glass Company. Stocks will be carried at Wilmington, California, and San Francisco.

O. J. Bagnoli Confers With Wilson Representatives

O. J. Bagnoli, Vice President and General Manager of Thomas C. Wilson, Inc., is now conferring with Wilson representatives in important western maritime and industrial centers. The itinerary includes San Francisco, Seattle and Vancouver. Stops will also be made at Akron, Cleveland, Chicago, Denver and Salt Lake City.

Foster Wheeler Promotes John West

John M. West has been appointed Director of the Public Relations Division of Foster Wheeler Corporation, New York, in charge of advertising, publicity, literature and house organs. Mr. West has been with Foster Wheeler since January, 1940. His previous duties included sales engineering, as well as design of equipment.

John M. West

Tom Plant (left) and George Plant.

O. J. Bagnoli, Vice President and General Manager of Thomas C. Wilson, Inc.

Plant Bros., Inc.

Their many friends in San Francisco Maritime circles will be interested to learn that Thomas G. Plant, Jr., and George B. Plant have joined forces in a new venture to be known as Plant Bros., Inc. The new firm is licensed to do general engineering, building and painting contracting, and has established headquarters at 1168 Battery Street, San Francisco.

Both Tom and George are well known on the San Francisco waterfront. Tom was with Bethlehem Steel Company's Shipbuilding Division for more than five years as assistant to the general superintendent. He resigned about a year ago to enter the construction field in Marin County.

George has been operating the Sopac Ship Maintenance Company for the past several years following his discharge from the Army. He also operates International Freightways. Both brothers have had wide experience in the engineering and building contracting field, particularly during the slack time in shipbuilding activities during the period previous to the war.

In addition to general engineering construction work, Plant Bros., Inc., will engage in commercial and residential building, remodeling, painting and decorating, sandblasting and steam cleaning, and tank and pipe cleaning.

H. O. Hill Elected President of The American Welding Society

The American Welding Society recently announced the election of Harold O. Hill as its President for the year 1947-48. Mr. Hill assumed that office on October 24, at the conclusion of the 1947 annual meeting in Chicago.

Mr. Hill began his engineering career with the Riter-Conley Company in Pittsburgh, and was Chief Engineer at the time this company merged into McClintic-Marshall Company, when he became Assistant Chief Engineer of the enlarged company. When the McClintic-Marshall Company was merged with the Bethlehem Steel Company in 1931, he continued his same duties with the Bethlehem Steel Company, and is now Assistant Chief Engineer, Fabricated Steel Construction, of the Bethlehem Steel Company at Bethlehem, Pennsylvania.

Mr. Hill has held many offices in the Society and has been on numerous important committees during the 16 years he has been a member.

G. P. Shandy Named Superintendent of New Radiomarine Division

The appointment of G. P. Shandy as Superintendent of the newly-established Central Division of the Radiomarine Corporation of America, with headquarters at Cleveland, was recently announced by George F. Shecklen, Executive Vice President. G. I. Martin has been appointed Assistant Superintendent of the new division, with offices in St. Louis serving the area of the Mississippi River and its tributaries.

The new division replaces the corporation's former Great Lakes and Midwest Divisions, and covers the same combined territory. Mr. Joseph D. James will have charge of a service station and branch office in Chicago.

Increased demand for Radiomarine's river-range 3.2-centimeter radar and radiotelephone for use on towboats and other river craft prompted the company to extend its service facilities in the Mississippi area.

Harold O. Hill, President of the American Welding Society.

John Seagren Appointed by Atlas Imperial Diesel Engine Co.

J. R. Meidel, President of Atlas Imperial Diesel Engine Company of Oakland, recently announced the appointment of John Seagren as Chief Engineer of the Diesel engine concern. Before coming to Atlas Diesel, Seagren was Chief Engineer of the Diesel Engine Division of the American Locomotive Company at Schenectady. He was with Atlas Diesel however, from 1931 to 1944 when he resigned to go East.

Seagren will be supported by an able staff of engineers, designers and draftsman, many of whom have been with the Atlas organization for years. The Atlas management has in mind an extensive program of development and modernization of its Diesel engines, especially in the marine industry where they have long enjoyed an enviable reputation.

George F. Shecklen (left) and G. P. Shandy, of Radiomarine Corporation of America.

Hotpoint Appoinments

The appointments of Howard J. Scaife as manager of market development, and William F. Ogden as manager of product planning, have been announced by L. C. Truesdell, vice president of marketing of Hotpoint, Inc.

Ogden came to Hotpoint in 1936 from the Georgia Power Co., and since that time has served as commercial engineer, and more recently as assistant chief engineer. He is a graduate of Swarthmore college.

Scaife, a graduate of Case Institute of Technology, was associated with the General Electric Co. in various capacities from 1932 until 1936, when he was transferred to Hotpoint as assistant sales manager of refrigeration. In 1944 he was named western regional sales manager.

John Seagren, Chief Engineer, Atlas Imperial Diesel Engine Co., Oakland.

Anchor Equipment Co.

Announcement has been made by Ted S. Jerstad and Alan H. Scurfield of a change in their firm name to Anchor Equipment Company. Headquarters of the firm, formerly the Bay Equipment Company of San Francisco, are at Pier 3, San Francisco.

Anchor Equipment also announced that it has been appointed as representative in this area for the Industrial Chemical Company of Los Angeles, producers of Induco fluid for Diesel engines.

The Mobilube Boiler Repairs

(Continued from page 43)

header was stripped of tubes and handhole plugs that we found that some of the holes were badly egg-shaped due to the distortion. These holes were plug welded, then drilled and reamed to their original size. Upon completion of repairs to these parts, they were stress-relieved, Magna-fluxed and X-rayed.

The partial stripping of this boiler enabled us to incorporate the latest Foster Wheeler specifications such as seal welding against gas and soot leaks, the drum seals and certain other sections that are not readily accessible, however since Bethlehem Steel is doing an excellent job erecting the new boilers and repairing the starboard boiler, these boilers will outlast the ship, with the possibility that the operators might eventually wish to jack them up and put a new ship under these units. Therefore we did not weld them to the foundation.

Westinghouse Repairs Gears and Gearcase on Mobilube

(Continued from page 43)

checking and correcting of bearing bores when necessary.

In determining what had to be done, all rotating elements were first "Magnafluxed" to enable exact location and extent of cracks or other defects. The bullgear wheels were rotated on the shaft, and it was learned that force of the torpedo explosion had loosened one of the two bullgear wheels from the shaft. It was found more feasible to supply a new shaft than to endeavor to re-establish the original fit. A new forging for this big shaft (21inches in diameter, 12 feet long and weighing about 11,100 pounds) was obtained from *stock* at Sunnyvale, and was machined and installed there in the gear wheel spiders.

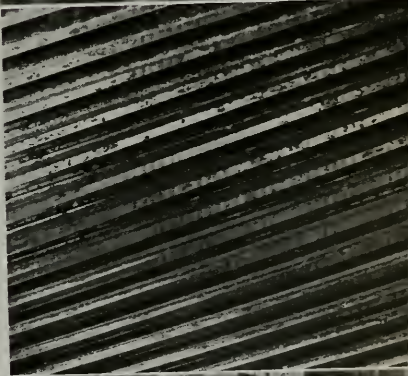
All gears had been under salt water for some time, hence had been badly pitted by chemical action of the salt water on steel. Some of the teeth had also been deformed by force of the explosion. Numerous holes had been blown into plates on the after end of the gearcase, necessitating almost complete rebuilding of the case. It was found necessary to install a new rim on the low pressure high speed gear wheel, and hob it, because force of the blast had loosened the original wheel and it had shifted axially on the spider.

After all repairs had been made, gears were completely assembled in the gearcase and the proper running alignment was obtained to insure proper backlash and tooth contact. Alignment readings then were taken of the complete assembly, and it was disassembled and trucked to the ship.

The people at Sunnyvale are pretty proud of this job, done in its entirety there by Sunnyvale plant people, on Sunnyvale machines, and with all required replacement parts and materials obtained from Sunnyvale stocks.

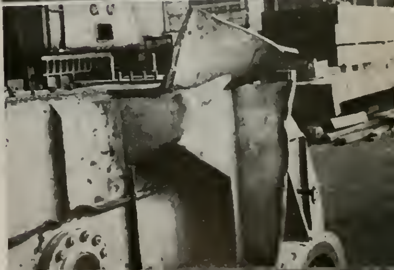
Close-up of after after port corner of gearcase, showing some of damage done by torpedo.

Same corner of gearcase after repair at Sunnyvale Works, Westinghouse Electric Corp.



Section of bullgear teeth before rehobbing, showing pitting and tooth deformation.

Hobbing the low pressure high speed gear wheel of the Mobilube at the Sunnyvale Works.



Gear case cover, aft side, showing torpedo damage.

NAVY DAY SNAPS

THE NEW CHIEF

Dan London (left), manager of St. Francis Hotel, and President of San Francisco Council Navy League of the U. S.; Admiral Louis Denfeld, Commander in Chief of Pacific Fleet. Since picture was taken at San Francisco's Navy Day celebration, Admiral Denfeld has been named by President Truman to be Chief of Naval Operations succeeding Admiral Nimitz.

PROPELLER POURING

On Navy Day the Mare Island Navy Yard put on a show for visitors from Northern California. Included was the demonstration pouring of a propeller in the foundry. Shown above is a pattern propeller and two castings. The actual pouring is taking place in the top picture.

WRITERS' AWARDS AT PROPELLER CLUB CONVENTION

During the recent national convention fo the Propeller Club of the United States, a luncheon was held at the Waldorf-Astoria Hotel, New York City, honoring winners of awards in nation-wide newspaper contest during the year 1946. Darsie L. Darsie of the Los Angeles Herald-Express won first prize for Editorial on the American Merchant Marine. Edsel Newton of the Long Beach Press-Telegram won first prize for News Articles.

FAREWELL PARTY FOR L. W. BAKER AT SEATTLE

Top picture, left to right: G. W. Skinner, President of the Alaska S. S. Co., and L. W. Baker, retiring Vice President and General Manager. Bottom, left to right: Emil Hanson, Supt., Alaska Terminal & Stevedoring Co.; Allan N. MacClellan, Freight Claim Agent, Alaska S. S. Co.; U. W. Killingsworth, Manager, Alaska Terminal & Stevedoring Co.; G. S. Duryea, Asst. Supt.; J. Fred Zumdieck, Supt.; L. W. Baker, retiring Vice President and General Manager; Capt. Richard A. Johnston, Port Captain; Joe McNulty, Asst. Port Engineer, all of Alaska S. S. Co.

Left to right: Howard W. Woodruff, Sec.-Treas., Port of Los Angeles-Long Beach; Darsie L. Darsie, Los Angeles Herald-Express, Winner of first prize for Editorial on the American Merchant Marine, 1946; Harold J. Harding, National Sec.-Treas., Propeller Club of the United States; Arthur Eldridge, President, Propeller Club, Port of Los Angeles-Long Beach, and General Manager, Los Angeles Harbor Department; Edsel Newton, Long Beach Press-Telegram, Winner of first prize, News Articles, 1946; and Ralph M. Hylton, Delegate from Port of Los Angeles-Long Beach recently transferred to office of De La Rama Steamship Co., New York.

HOW SHIP LINES *show* BIGGER PROFITS

AMERICAN PRESIDENT, ALCOA, PANAMA, PACIFIC CRUISE LINES ADOPT A NEW CONCEPT IN FUNCTIONAL BEAUTY.

Distinctive Cocktail Bar and Lounge of the Alcoa Cavalier. Styled by Lurelle Guild.

Luxurious Main Lounge of Pacific Cruise Lines SS Corsair. Designed by William Schorn Associates.

Combination Living Room and 4 passenger Stateroom, Panama Lines SS Ancon. Conceived by Raymond Loewy Associates.

Stateroom, American President Lines, SS President Cleveland. Naval Architect, George S. Sharpe

Arnot engineers and designers have developed and produced sleeping accommodations and furniture that combine passenger luxury with space-saving efficiency. Many famous lines are now sailing with Arnot Distinctive Furniture, including the Arnot guest-operated Sleepers that are revolutionizing shipboard living, making every room a suite! Comfort and luxury, lower maintenance and greater passenger capacity are good reasons why Arnot Equipment is aboard hundreds of ships. Let us tell you how!

DISTINCTIVE FURNITURE BY

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ARNOT & COMPANY, INC., BALTIMORE, MARYLAND ★ ARNOT SLEEPER CORPORATION, BALTIMORE, MARYLAND
JAMESTOWN, NEW YORK LOS ANGELES, CALIFORNIA BERKELEY, CALIFORNIA WASHINGTON, D.C.

Pacific Marine Review

NEWS FLASHES

ARMY CALLS FOR BIDS

The San Francisco Port of Embarkation is calling for bids on 9 more transports, to be opened December 10 and December 15.

The C-3s Funsten and O'Hara are to undergo complete conversion.

The C-4s Hodges, Hase, Morton, Patrick, Collins and Freeman are to get "safety" conversions, as is also the C-1 Hospital ship Comfort. Bids on the Morton are due December 10, and all others on December 15.

* * * * *

MATSON CALLS FOR BIDS ON MONTEREY

Naval Architect George Sharp is drawing up detailed specifications for completion of the Matson liner Monterey. Work on both the Monterey and its sistership the Mariposa, at the United Engineering Co. yards, was halted in July. The Mariposa is almost completed.

By comparing bids on work remaining on the Monterey with what is needed for the Mariposa, total conversion costs for both can be estimated.

* * * * *

NAVY LEASING FLOATING DRYDOCKS

The United States Navy, represented by the Bureau of Yards and Docks, received sealed bids on December 3 for the leasing of 15 floating drydocks, ranging in nominal lifting capacity from 1,000 tons to 18,000 tons, now located at various shipyards along the West Coast from San Diego, California, to Seattle, Washington.

* * * * *

HILCONE PURCHASES

The Navy carrier Sangamon, an 18,000-ton vessel, and the Navy tankers Trinity and Salinas, both 12,600 tons dead weight, were awarded to the Hilcone Steamship Company of San Francisco. Hilcone was high bidder for the Sangamon at $356,666 and the Trinity and Salinas at approximately $200,000 each. The carrier was formerly a tanker and will be reconverted.

Application for four Liberty type tankers was made also by Hilcone. If the application is approved, Hilcone Steamship Company will again become the largest independent oil carriers on the Pacific Coast, operating about 100,000 tons in tankers.

* * * * *

FOREIGN TRADE ZONE FOR SAN FRANCISCO

As we go to press the 10-year fight for a free zone for San Francisco was approved in Washington.

JOHNSON FIRM BUYS STOCKTON SHIPYARDS

Final approval of the sale to the Walter W. Johnson Company of San Francisco, of the facilities of the Pollock-Stockton Company at Stockton, wartime shipyards, is announced by the War Assets Administration.

Sales price for the facilities, which are located on 60 acres of land owned by the city of Stockton, was $72,380.

The Johnson Company plans to use the yard to obtain scrap metal.

* * * * *

SPERRY PRODUCTS TO RELOCATE IN CONNECTICUT

Sperry Products, Inc., manufacturers of hydraulic remote controls, will move its manufacturing plant and general offices from Hoboken, N. J., to Danbury, Conn., during the summer of 1948. A 20-acre site has been acquired and construction of a monitor-type manufacturing building and a three-story office building will begin immediately.

* * * * *

ALLIS-CHALMERS BACK IN HIGH GEAR

A drive to hire 1,540 men and build night shifts of Allis-Chalmers Manufacturing Co., West Allis Works, to a record peacetime high has been disclosed by James M. White, vice president in charge of manufacturing.

"Because of an increasing number of orders, our need for additional personnel is urgent," said White. "The order backlog in the company's general machinery division alone is now more than $166,000,000."

* * * * *

OCTOBER EXPANSION IN THE WEST

Southern California:

During the month of October, 16 new factories were established in Los Angeles County with a total investment of $464,000, and creating 352 new jobs for factory workers. Forty-one (41) existing plants were expanded, calling for an additional investment of $8,617,000, and creating 1,594 new industrial jobs.

Total investment in the 57 new and expanded units was $9,081,000, creating a total of 1,946 new jobs.

For the year to date, 185 new factories were established with a total investment of $67,668,000, and creating 7,064 new jobs; 344 existing plants were expanded, calling for an additional investment of $45,149,500, and creating 11,956 new industrial jobs.

Total investment for the year to date in the 529 new and expanded units was $112,817,500, creating a total of 19,020 new jobs.

* * * * *

October industrial development in Northern California and the San Francisco ay Region totaling 46 projects to cost $9,386,850 brought the first 10 months tabulations of 1947 to 695 projects representing $122,472,875 in outlays.

Ten month's developments for 1947 summarize as follows:

NORTHERN CALIFORNIA

286 expansions	$ 66,684,850
408 new plants	55,788,025
695 projects	$122,472,875

Bay Region

233 expansions	$ 63,056,350
327 new plants	41,170,900
560 projects	$104,227,250

San Francisco

77 expansions	$ 11,837,200	2,491 jobs
88 new plants	2,494,500	636 jobs
165 projects	$ 14,331,700	3,127 jobs

PACIFIC ENGINEERING & SUPPLY COMPANY, Pier 62, San Francisco, is a new firm occupying 10,000 square feet and employing 10 in the production of box conveyors.

* * * * *

VESSELS IN ONE PACIFIC COAST YARD, NOVEMBER 28

Ship	Owner	Nature of Work
SS MOBILUBE	Gen. Petroleum Corp.	Repair & Conversion
USAT DAVID C. SHANKS	U. S. Army Trans. Corps	Conversion
MV ALGORAB	Pillsbury & Martignoni	Conversion & Engine Repair
USAT FRED C. AINSWORTH	U. S. Army Trans. Corps	Conversion
MV SILVERGUAVA	Kerr S. S. Co.	Main Engine Repairs
SS MISSION SOLERAR	U. S. M. C.	Recommission
SS VALLEY FORGE	American Pacific SS Co.	Survey, as per Spec.
SS JOPLIN VICTORY	Pacific Far East, Inc	Hull damage repairs
SS MARINE LYNX	Amer. Pres. Lines	Routine Drydock & Inspect.
SS PRESIDENT CLEVELAND	Bethlehem, Alameda	Routine Drydocking
SS SAGINAW	States Marine	Drydock & Survey
SS HAWAIIAN PLANTER	Matson Nav. Co.	Repair & Alterations
MV EGERO	Gen. S. S. Co.	Miscl. Voyage Repairs
MY HILO	Pillsbury & Martignoni	Survey
SS SANTA PAULA	Union Oil Co.	Hull Alterations
SS GENERAL MEIGGS	Amer. Pres. Lines	Routine Drydocking

* * * * *

FOUR MILLION SURPLUS OFFERED IN CANAL ZONE

Bids for surplus property located in the Panama Canal Zone which cost the U. S. Government over $4,000,000 will be accepted in Balboa, Canal Zone, until 10:00 A. M., December 15, 1947, Major General Donald H. Connolly, Foreign Liquidation Commissioner, recently announced.

Bid forms for the sale, and additional information may be obtained from the Foreign Liquidation Commission, Box 2003, Balboa, Canal Zone, or from the General Disposals Division, Office of the Foreign Liquidation Commissioner, 4th and Jefferson Drive, S.W., Washington 25, D. C.

* * * * *

FEDERAL COURT APPROVES COLUMBIA STEEL PLAN

The program for purchase of Consolidated Steel by Columbia Steel, Previously approved by both companies, has now been cleared by the federal court.

The decision rendered by the United States District Court holds:

(1) That acquisition by Columbia Steel of the steel fabricating business of Consolidated Steel will not unreasonably restrain trade in rolled steel products or in fabricated steel products.

(2) This acquisition will not tend to create a monopoly.

(3) There is no evidence in the case of a monopoly.

(4) The defendants are entitled to a judgment dismissing the complaint on the merits.

These Steel fabricating properties of Consolidated Steel Corporation are principally located at Los Angeles and San Francisco, California, in areas where United States Steel now has no fabricating facilities of similar character.

New Mare Island Commander

Rear Admiral Frank J. Lowry, U. S. Navy, relieved Rear Admiral Mahlon S. Tisdale, U. S. Navy as Commander Mare Island-Vallejo Area, U. S. Naval Base, San Francisco, in ceremonies held aboard the station October 30.

Rear Admiral Frank J. Lowry

BOOK REVIEW

ELECTRIC MOTOR MAINTENANCE, by W. W. McCullough of the Manufacturing & Repair Division, Westinghouse Electric Corporation; published by John Wiley & Sons, Inc. Size 5½" x 8½", 126 pages. Price $2.00.

This book is intended to help inspectors, mechanics, electricians, and engineers take better care of the motors for which they are responsible. Some fundamental principles of electric motors are reviewed so that the reader will appreciate the transformation of energy which takes place.

Part One of the book deals with mechanical maintenance, motor assembly, bearings, current collecting devices, and air gaps. Part Two, on electrical maintenance, treats of insulation (materials, cleaning and drying, testing). Part Three covers characteristics of induction; direct-current, synchronous and gear motors; motor generator sets, and electric couplings. A practical book for supervisors, mechanics, plant engineers, electricians and students.

Certificate of Merit to Leigh R. Sanford

On November 6, Leigh R. Sanford, Executive Vice President of the Shipbuilders Council of America, received the certificate of merit for wartime services as director of ship construction for the Maritime Commission. The presentation was made by Secretary of Navy John L. Sullivan.

During Sanford's wartime service, the Commission supervised the construction of more than 5600 vessels of more than 39,000,000 gross tons, the greatest shipbuilding program in world history. A naval architect, marine engineer and lawyer, Sanford has been active in the maritime field for 37 years, most of which has been in the service of government maritime agencies. At the outbreak of World War I, he entered government service and served with the Emergency Fleet Corporation until 1932. After receiving his law degree in 1934, he returned to government service with the Merchant Fleet Corporation, and became chief of the Maritime Commission's construction section in 1940. In 1942 Sanford was transferred to New Orleans where he served successively as regional director of construction for the Gulf Coast, Gulf-Great Lakes and Eastern regions. He was appointed director of construction for the Commission in 1945, and left the Maritime Commission in July 1946 to join the Shipbuilders Council of America.

Leigh Russell Sanford

More production and more trade are the first two milestones on the economic road to stable international relations.—Editorial in London Times.

Continuing prosperity in these United States in the long run will contribute more decidedly to world health than all the steps we have taken thus far.—Treasury Secretary Snyder.

The Women's Organization Achieves National Stature

(Continued from page 74)

A. Under the Ship Sales Act of 1946, only American citizens can charter our vessels. As of June 30th last, 1510 vessels were under charter. As of September 30th last, this had been reduced to 1347 vessels. Most of these chartered vessels are utilized to meet the temporary need for transporting relief cargoes.

Q. What is the size of the merchant fleet operating under the American flag today?

A. Roughly, there are about 2700 ships including tankers and the 1347 vessels on temporary charter. Our prewar marine strength was about 1100 vessels.

Q. Is it intended to stabilize the fleet at 2700 vessels?

A. No—it is deemed essential that the fleet be composed of approximately 1200 fast, modern ships, and about 1500 in the essential reserve fleet, made up of the slower type for emergency purposes.

Q. What new shipbuilding is now under way in American yards?

A. There are 36 vessels now under construction in American yards. Of these 36, 13 are for Brazil and 4 for Argentina. But the yards are not idle—there is a large volume of reconversion and repair going on throughout the country—however, eventually some long-range construction will be necessary in order that essential shipyards, involved with national defense, can remain in operating condition ready for any emergency, with trained men and modern machinery.

Q. Has the Maritime Commission a program for new construction and ship replacement?

A. It certainly has—the Merchant Marine, which is both an industry and an arm of our national defense structure, must also have replacements which will keep it modern and strong. To this end, the Maritime Committee has placed strong recommendations before the President's Advisory Committee on the Merchant Marine, for a long-range program of new construction and betterments, endeavoring to initiate anew a building schedule for rehabilitation of the Merchant Marine, such as that started in 1937. The Maritime Commission has a 25-year replacement program. This plan is split into two parts. A program for the first ten years, and a program for the succeeding 15 years. In the first ten years we hope to see 25 ships a year built in American yards—or a total of 250 ships to replace present ones in operation. In the subsequent 15 years we hope to increase that to 64 ships a year.

Q. What about foreign shipyards?

A. Foreign governments, steamship lines, etc., have purchased from us about 1000 vessels. To some extent this has taken care of their immediate needs. However, despite their war losses, they still have many ships, and their shipyards have been and are very busy. If you take the shipyards of the world as a whole, I think there were, as of the first of this year, 959 ships under construction, as compared with 36 ships building in American yards.

Q. What proportion of our total exports are we carrying in American ships today?

A. At the beginning of this year, about 70%. Right now it is difficult to say accurately. However, one recent report indicates that we are carrying about 53% of our exports. This indicates that foreign governments are fully utilizing vessels we have sold them, and also have been able to place in operation new vessels, as well as reconverted vessels used during the war. An example, of course, is the *Queen Mary*. Another is the *New Amsterdam,* which has just returned to service. To compete with vessels of this type we still have our lone passenger liner—the *America.*

The Magnetic Compass

(*Continued from page 68*)

as carriers for the permanent magnets used in compensating for semi-circular deviation.

4. A beveled gear and screw mechanism which allows adjustment of these carrier trays in height from 7 to 21 inches below the plane of the compass needle.

The *compass chamber* is cylindrical in shape and has accurate fore and aft and athwartships markings on the upper edge of the chamber. At right angles to the fore and aft lines on the inner side of the chamber are wyes in which rest the knife edges of the gimbal ring. Centered in these wyes are adjusting studs with locking nuts which screw in through threaded holes in the chamber wall for centering the compass.

The supporting arms for the quadrantal spheres may be cast as a part of the single casting of the binnacle stand or they may be cast separately and secured to the compass chamber. In either case they are slotted with four inch slots to allow adjustment of the quadrantal spheres from 9 to 15 inches from the center of the compass. In some cases these slots are equipped with a screw mechanism for adjusting the distance of the spheres from the compass. This mechanism is operated by the same type crank as the mechanism for adjusting the sub permanent magnet.

The quadrantal spheres are hollow soft iron spheres either 7 or 9 inches in diameter. The flinders bar holder is a cylindrical brass case about 2½ inches in diameter and 24 inches in length. It is secured to the compass chamber and pedestal in a vertical position with its center 9 inches from the center of the binnacle by means of brackets. An inner case of brass with a rubber pad in the bottom is supplied in most cases to assist in removing the flinders bars. The flinders bar holder should be so located as to allow the top of the flinders bar to be two inches above the plane of the compass needle.

The flinders bar is 2 inches in diameter and made of soft iron in 6 pieces of the following lengths: 1—12 inches, 1—6 inches, 1—3 inches, 1—1½ inches and 2—¾ inches so as to equal 24 inches. A set of hardwood filler blocks of the same dimensions are supplied with each set of flinders bars.

This completes the description of parts of the Magnetic Compass and Binnacle. With this as a background a forthcoming treatise on magnetism and compass compensation will be more easily understood.

Coal-Oil Conversion

(*Continued from page 38*)

cargo, were not increased with the installation of liquid-fuel appliances. The underwriters made careful examination of the arrangements for storing the oil fuel, as well as the general character of the oil-burning installation, and after special investigation regarded the equipment as one not constituting an element of danger sufficient to demand higher insurance rates.

"In order to detect and collect any leakage of oil a cofferdam had been constructed both forward and aft of the principal fuel-oil bunker. At the end of the journey no leakage of oil had been observed. The oil used was from the California wells, a product which had *undergone a light distillation,* thus making it less explosive and less harmful to boiler and bunker plates."

Admiralty Decisions

(*Continued from page 64*)

that any damage that might follow would and should be compensable. The New York Supreme Court in a case entitled *Edmond v. American Hawaiian Steamship Company,* was confronted with a claim made by a former cook and baker aboard a certain vessel that he was mistreated by the officers thereof and was threatened with bodily harm, causing him great mental anguish, which resulted in the mental condition claimed. The plaintiff further alleged that the defendant steamship company, through its employees, had knowledge of the mistreatment of the plaintiff and failed to take steps necessary to prevent its continuation. Plaintiff alleged he suffered a severe psycho-neurosis, for which he claimed damage in the sum of fifteen thousand dollars. The complaint, however, failed to allege any physical injury or physical contact with plaintiff. The injury sustained was simply a mental condition. State courts in the United States have differed with reference to permitting recovery for injuries consisting of mental conditions where no physical contact or physical injury is alleged or proved. The great weight of authority, however, has consistently held that there can be no recovery for nervousness or mental anguish where there is no accompanying physical contact or injury. Even the courts who follow the great weight of authority, recognize in their opinions that mental suffering or disturbance, even without consequences of physical injury, may in fact constitute actual damage; nevertheless, they do not regard it as such damage as gives rights to a cause of action though it is the direct result of the careless act.

Defendant moved to dismiss the complaint upon the ground that it did not state facts sufficient to constitute a cause of action. The court granted the motion to dismiss with leave to plaintiff to amend if he so desired. However, they pointed out to him that his allegation of mistreatment by the mere use of the word "mistreated," is insufficient to impart physical contact. The term is simply conclusory.

It might be said that this rule represents an exception to the general tort rule. The rule came into existence primarily because of the inability to provide sufficient proof of the connection between the alleged accident causing the injury and the mental illness or injury itself. This appears to be a poor excuse for the exception in view of the fact that it would still be incumbent upon the plaintiff to prove the proximate cause of his injury. However, the rule exists as set forth in many, many jurisdictions and until some farseeing judge believes differently and sees the light, we shall be required to abide by it.

Tug Tows Three Destroyers

(*Continued from page 61*)

quarter of the Ono, in spite of the rudder angles.

The Ono was designed for Navy service as the ATA-223. She was purchased just prior to completion and reconverted by Isleways, Ltd. for its needs in the Hawaiian Islands. In the off season when pineapples are not being harvested, the Ono and her sister ship, the Ahi, are available for towing jobs. They are 143 feet long, have a 33 foot beam, and a 15½ foot draft. They are powered by two 1000 horsepower General Motors diesels. These tugs were completely described in the September 1946 Pacific Marine Review.

Sperry Loran

SPERRY GYROSCOPE COMPANY, INC. has just prepared a new brochure, "Sperry Loran," for the marine trade. The booklet describes in considerable detail all phases of this electronic system for determining the geographical position of ships, including features of the equipment, its specifications and operation.

Copies of the publication (23-202) are available on request from the Sperry Gyroscope Company, Inc., Great Neck, New York.

Worm Gearing Bulletin

DE LAVAL STEAM TURBINE COMPANY has issued a new worm gearing bulletin (WG1220-5-46) describing and illustrating the advantages of worm gearing, AGMA service classification, bearing load formulae, quality control and precision manufacturing, selection practice, horsepower ratings, worm thread and gear tooth data for different ratios, dimensions and details of standard worm mountings, worm dimensions, gear dimensions and dimension of standard flanged rims.

Whitlock Cordage to Pedley-Knowles

The Whitlock Cordage Company announces the appointment of Pedley-Knowles & Company, 134 Sacramento Street, San Francisco, as exclusive distributors of Whitlock cordage in the San Francisco Bay Area. Full stocks of Whitlock rope including the well-known Fibore are available in San Francisco.

Other Whitlock Pacific Coast distributors are Llewellyn Supply Company, Wilmington, California, and Fisheries Supply Company in Seattle and Portland.

Leslie Company Issues Special Folder On Controlled Heat

Leslie Co., 62 Delafield Ave., Lyndhurst, N. J., has just released a new illustrated folder entitled "Controlled Heat," describing its new line of Class "T" self-contained, self-acting, temperature regulators. The folder tells how accurate temperature control can be obtained at reasonable cost for many industrial applications.

Important features of the new regulator, as described in the folder, include single-seated construction in all sizes for steam pressures up to 125 psi; packless main valve; hard faced seating surface and hardened wearing parts; liquid filled thermostatic element. Sizes available are from ½″ to 4″ inclusive for steam pressures to 125 psi (175 psi liquid) and temperatures to 450° F. Data on selection, installation, operation and maintenance are included.

Airco Announces New Flux for Gas Welding of Stainless Steels

Air Reduction Sales Company recently announced the availability of a new flux for the oxyacetylene welding of stainless steels and high chromium-bearing alloys. The flux has been designated as Airco Formula #34.

The new flux was specifically compounded to dissolve the chromium oxides encountered in welding stainless steel and other high chromium-bearing alloys. Application by painting the immediate and surrounding surfaces to be welded protects the molten metal from the air, thus preventing oxidation.

BOOK REVIEW

SAN FRANCISCO, PORT OF GOLD, by William Martin Camp; published by Doubleday & Co., Inc. Size 5¾″ x 8½″, 518 pages. Price $5.00.

Written by a man who knows San Francisco as it was and as it is today, this book is both a valuable record and a book of fascinating history, telling the story of the Bay from the days of the gold rush and whaling ships to the explosive labor troubles of today. It is different from other books about San Francisco because it is written about San Francisco—the Port—rather than about San Francisco—the City. The author also describes other cities and towns on the bay and tells how the port came of age. The book is rich in adventure and spiced with anecdote.

"S" BAND OR "X" BAND RADAR?

By CHARLES W. CHATTIN

of Marine Electronic Engineers

THE PRESENT CONTROVERSY between the relative merits of "S" band and "X" band radars has had the effect of clouding the real benefits of this remarkable equipment and tended to make ship operators "wait and see" before deciding on a program. Actually, either band will give exactly the same results for all normal operations and it is believed that other items, such as cost and maintenance considerations, should be given as much or more weight when selecting the type of equipment.

The band designates the nominal radio frequency of the carrier. "S" band frequency is between 3000 and 3246 megacycles, which corresponds to a wave length between 10.0 and 9.2 centimeters. "X" band frequency is from 9320 to 9500 megacycles, giving a corresponding wave length from 3.2 to 3.1 centimeters. Another frequency band between 5.5 and 5.3 centimeters is authorized for merchant marine radar but no equipment operating at this frequency is at present on the market. Each band has certain desirable characteristics with respect to the other which more or less tend to balance. A discussion of those characteristics follows:

Target Resolution. Electrical characteristics are such that the higher the carrier frequency the shorter can be the pulse length and the narrower the beam. These are the factors that determine the resolution of targets as seen on the radar scope. Hence, the "X" band radar will give a clearer scope picture and is better able to discriminate between targets close together than is radar using the "S" band. In other words, a single ship will appear as a larger "blob" on the "S" band scope than it will with the "X" band, two ships 200 yards apart may appear as a single "blob" on the "S" band scope while they appear as two "blobs" on the "X" band scope. But, in terms of collision prevention and navigation, of how much value is this high degree of resolution? Normally two ships will not remain within close range of each other for any length of time, and an alert operator is fully cognizant of the situation. Also, the same preventive measures would probably be taken to avoid any object, regardless of its composition. In restricted waters, the sharper resolution will be of more value. Objects will appear nearer their true dimensions, and the inexperienced operator will be able to maintain a more accurate position. However, it has been proven that experienced operators, who are familiar with the manner in which radar "shadows" distort the scope picture, have no difficulty determining accurate positions with either equipment, even under the most severe conditions.

Wave propagation. The higher the carrier frequency the greater is the attenuation, or loss of energy, with range and with change in transmitting medium. Also, the higher the frequency, the more nearly the beam follows "line of sight" characteristics. This means that the "S" band has better propagation characteristics than does the "X" band. The result is that, in order to dependably cover the required ranges, "X" band equipment must have more power, and greater consideration must be given to special circuits than is necessary with the "S" band. Waves, rain squalls, and other weather conditions will show up more on the "X" band and will have a tendency to obscure targets. This condition is compensated for by "sensitivity time control" and "fast time constant" circuits but also requires more careful operation of controls. Occasionally, phenomenal ranges will be noted in trade wind areas due to "duct" propagation or trapping of the beam near the surface of the water by atmospheric conditions. This condition is not generally considered reliable but it becomes more dependable with the higher frequency, or "X" band.

Weight and size: Radio frequency components such as the antenna and the wave guide will be smaller and lighter with the "X" band. This is a prime factor in the preference of "X" band for aircraft use but is generally not important for ships.

Maintenance: Failures and difficulty of maintenance generally run in direct proportion to the number of tubes and other components in an equipment. As "X" band equipment requires more power, and special circuits are more necessary, that equipment will generally require more maintenance if the engineering of the equipment is equal.

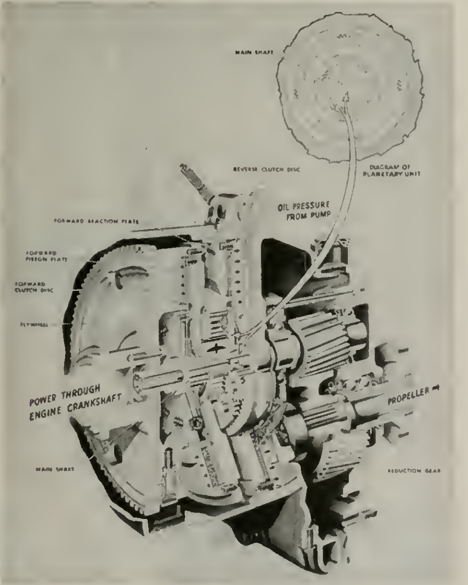
Obsolescence: The present commercial radar is the result of highly concentrated government financed development. It is not likely that private industry will see fit to change the present equipment greatly for a number of years. As a radar is a complete unit within itself the frequency of operation will not outmode an equipment except for individual preference, and it is probable that either frequency may fit the requirements for an individual better than the other. However, it is possible that certain accessory aids may become available for one frequency and not the other. The Coast Guard has recently been authorized to activate "X" band racons (radar beacons) at several points along the Pacific Coast. As the Coast Guard lacks personnel to man these stations and the required accessory equipment for the ship radars is not available at the present, it is probable that this will not be a factor for at least another six months. It is probable that "X" band racons are given a higher priority as aircraft radar generally uses that frequency.

"X" band radar was recommended to the Lake Carriers Association in a report by Jansky and Baily of Washington, D. C. However, the Coast Guard in its "Advisory Minimum Specifications for Navigational Radars" recognized the fact that ten centimeter radar might be more desirable for open sea navigation. The main criticism of the Jansky and Baily report is that it failed to include maintenance considerations which are of prime importance for ocean-going vessels. It is hoped that the above considerations might act as a guide in the selection of an equipment to meet specific needs. However, it is believed that either frequency will meet the most exacting requirements and that other factors should be the determining influence.

This photograph shows a 39-foot strongback, designed and fabricated at Bethlehem Steel Company's San Francisco yard, to carry a load of 65 long tons, being tested with weights totaling 160,000 lbs. This 16,000-lb. strongback was recently installed on the M. V. Ste. Helene, a 320-foot CI-M-AVI Coastal motorship type vessel recently purchased from a U. S. lay-up fleet by the French Goverment to transport railroad locomotive and cars. The San Francisco Yard recently fabricated and installed on the vessel two 65-ton capacity booms which were rigged in what constituted the largest job of this type to be performed on a commercial vessel on the Pacific Coast since the war.

The unusual rigging job on the Ste. Helen was featured in the October Pacific Marine Review.

In the background above is Matson's Mariposa in the Bethlehem drydock.



The new General Motors marine Diesel engine and hydraulic gear combination.


Specify GREENBERG standard or special BRONZE VALVES
Your jobber can supply them

Bronze OS&Y Rising Stem Wedge Disc GATE VALVE

Especially suitable where fluids might affect inside threads. Constructed with high safety factor against pressure and operating strains. Standard sizes, 1½" to 10", 150 pounds pressure. Sizes 6" and larger have renewable seats. No. 763 flgd; No. 765 screwed.

No. 763

STEAM VALVES GLOBE

Complete line of standard bronze globe angle and cross valves for steam working pressures up to 150 pounds. Also extra heavy globe valves for pressures up to 300 lbs. steam. Bolted bonnets. No. 752G shown.

No. 752G

MARINE ANGLE VALVE

Bronze 150 pound hose valve with non-metallic disc, bolted bonnet, OS&Y. 1½", 2" or 2½". With cap and chain. Screwed angle, No. 775. Flanged angle, No. 774.

No. 774

Approved by Underwriters Laboratories, Inc. Bronze 300 LB. HOSE GATE VALVE

Non-rising stem, solid wedge disc. Large stuffing box, asbestos packing. Screwed type with cap and chain. Sizes 1½" and 2½". No. 1064.

No. 1064

SPECIAL VALVES

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NOTICE INVITING BIDS

Sealed bids are invited by the General Manager of the Harbor Department of the City of Los Angeles, in accordance with Specification No. 1071 for

SALE OF BARGE "COLUMBIA CONTRACT CO. NO. 40" AND TUG "LAHD NO. 7"

This specification covers the sale of Barge "Columbia Contract Co. No. 40," a 150′ wooden barge, and Tug "LAHD No. 7," a 66′ wooden tug.

Bids must be submitted on form provided for that purpose, enclosed in a sealed envelope plainly marked "Bid for SALE OF BARGE "COLUMBIA CONTRACT CO. NO. 40" AND TUG "LAHD NO. 7" and must be filed with said General Manager at or before 2:30 o'clock P. M., December 17, 1947, at Room 102 City Hall, Los Angeles 12, California, at which time the bids will be publicly opened and read in Room 214.

Form of Proposal, Instructions to Bidders, Affidavit of Non-Collusion, Specifications, Contract, and Bond will be furnished upon application to Harbor Engineer, Branch City Hall, San Pedro, California, Phones NEvada 61721 and Terminal 2-7241, Station 276.

Each bid must be accompanied by a check certified by a responsible bank in the City of Los Angeles, or by a satisfactory bond, payable to the order to the Board of Harbor Commissioners, for an amount not less than 10 per cent of the aggregate sum of the bid, as a guarantee that the bidder will enter into the proposed contract if awarded to him, and will satisfactorily complete the contract.

The right is reserved to reject any and all bids.

ARTHUR ELDRIDGE
General Manager.

Dated November 19, 1947.
Specification No. 1071

Ocean Tow Converts Four Navy YF Barges

(Continued from page 66)

Seattle naval architect. Well-known throughout the country in naval engineering circles, Nordstrom has practiced in Seattle since 1928, serving for a time with the loadline assignment group at the request of the government. During the war, he served as a naval reserve officer with the rank of captain.

Modification was accomplished by the Lake Union Drydock Company, Seattle, with Frank Oliver, plant superintendent, supervising.

Ocean Tow floating plant also includes BCL's, 204-foot seagoing moulded barges with a 45-foot beam and a dead weight cargo capacity of 1,800 tons each.

The firm's twin-screw seagoing tugs of 1,380 h.p. carry some of the latest navigation equipment in use in North Pacific waters. First commercial vessels of their type to be equipped with radar, the tugs, 126 feet long, have General Electric installations with 2-mile, 6-mile and 30-mile range.

Officials of Ocean Tow include C. R. Shinn, president; L. B. DeLong, vice president and general manager; George F. Tait, assistant general manager; and Martin E. Guchee, Port Captain in charge of marine operations. Ocean Tow business and berthing headquarters are at Pier 50, Seattle.

World's Largest Crane

(Continued from page 50)

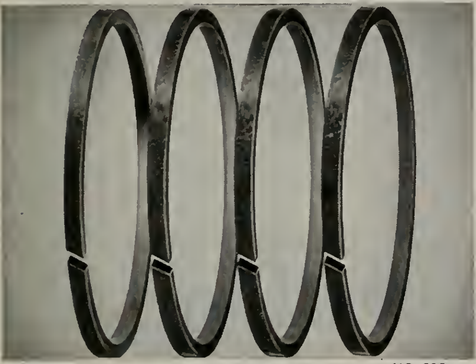
and providing for drift on the first points forward and reverse. The panel will include a common line disconnecting switch, undervoltage and individual overload protection.

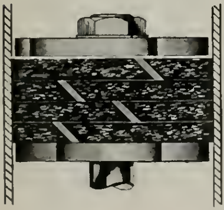
Trolley Drive. One 50-hp 600-rpm wound-rotor motor, duplicate of the bridge propelling motors, will be used to propel the trolley and will be geared for 40 fpm. The trolley drive will be equipped with two electric brakes to have a combined capacity of not less than 150 per cent of the rated full-load torque of the driving motor.

The control for the trolley motor is similar to the bridge control except that it is for a single motor. The first points forward and reverse are for drift as on the bridge control.

Limit switches will be provided to limit the travel in both directions. Since the trolley control panel will be located in the control house on the crane bridge structure, the limit switches also will be located on the bridge structure and will be tripped by dogs installed on the trolley. This arrangement reduces the number of collector bars between the bridge and trolley. Eight collector bars are required, however, to accommodate the three primary leads, the three secondary leads to the motor and the two leads to the trolley brakes.

A by-pass push button, located in the operator's cab, enables him to move the trolley with limited power beyond the predetermined limits.






ATLAS
MARINE PAINTS
SUPER-TROPICAL
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U. S. Built Motor Ships For France

(Continued from page 46)

to fifteen RPM above the speed of the maneuvering engines. Its handwheel is then set to the same fuel position as control levers of the other engines. Its coupling lever is then moved to the ahead position, connecting the engine to the propelling system. When working one of these units as a generating engine the overspeed latch knob of the governor is depressed and turned and the overspeed knob is set at 320 RPM. With these settings the governor will regulate the engine at the desired speed.

At sea when all six engines are employed for propelling the ship, electric current is furnished by a 250 KW turbo-generator set, steam for which is supplied by an automatic waste-heat-oil-fired boiler. This unit is of the forced circulating type, supplying superheated steam at 171 pounds per square inch pressure and 617 degrees Fahrenheit. Auxiliary steam for feed pumps, oil heaters, feed-water heaters, and evaporators is supplied through a desuperheater in the steam drum. The waste-heat elements of this boiler will normally supply steam requirements of the vessels when underway at full power. The oil-fired element will cut in through the medium of an automatic pilot should operating conditions require additional boiler power.

There are two motor-driven fuel-oil transfer pumps and two fuel-oil centrifuges. There are lubricating oil filters and strainers for each main engine, although engine lube oil can be centrifuged by means of a cross connection to the fuel-oil centrifuges.

Through the medium of bilge pump and bilge and ballast pump, the usual drainage and ballasting operations can be conducted. There is also a fire pump and a general service pump. At main deck level in the machinery space there is a machine shop containing an eighteen inch by seventy inch lathe, a drill press, and a grinder.

While *M.S. Amienois* and her sisters were designed for a trade in which cargo is generally worked by shoreside cranes, they have been fitted with complete cargo-handling gear of their own. There are ten eight-ton cargo booms, each with its own electric winch. Four booms are rigged on stub kingposts in the way of the foremast, with the two forward booms of this group serving No. 1 hold and the two after booms serving No. 2 hatch. There are two booms at the forward end of the midships house, two at the after end of this structure, and two booms at the forward end of the poop house.

In addition to these booms and winches there are two two-ton booms and winches stepped on the boat deck, one on each side of the funnel. These units are rigged for handling ship's refrigerated stores or engine parts through the engine-room skylight.

The anchor windlass is of the electro-mechanical type with horizontal shaft. There are two wildcats arranged for independent operation and two warping heads on the shaft ends.

Navigating equipment, in addition to being extremely complete and above the general installations found in vessels of this class, contains several electronic devices of the latest postwar models. There is a radar set presenting a high degree of resolution, with a wide choice of range scales. It has a minimum range of one hundred yards, making it possible to utilize this equipment under the most adverse conditions of navigation. The cathode-ray scope or plan-position indicator is equipped with a gyro compass repeater by means of which the image may be viewed in either true or relative bearing.

Another aid to navigation installed in these ships is an underwater sound Fathometer with an electronic recording device. In addition to these items there is a gyro compass with four repeaters, one on each wing of each bridge.

The steering gear is of the electro-hydraulic, Rapson-slide, opposed piston type. It is fitted with two similar power units capable of operation individually or in parallel. Steering is controlled through a telemotor gear from the bridge steering stations.

The emergency generating set installed in these ships is somewhat larger than is ordinarily found in such vessels. It is a Diesel-driven unit of sixty KW capacity, which enables it to handle normal port loads when not working cargo.

These ships were designed for trade between the French ports of Le Havre, Rouen, and Dunkirk, and French North African ports. They will carry manufactured goods out and fresh fruit and vegetables home. *M.S. Amienois* will be operated by the Campagnie des Bateaux ce Vapeur du Nord between Dunkirk and Casablanca. It is expected that she will make the run between these ports in approximately three and one-half days.

One of these ships, the *M.S. Algerie,* was commissioned at Tampa on September 6, 1947, took on cargo at Houston and Corpus Christie, Texas, and when loaded underwent trials over the measured mile at Guantanamo Bay September 23. With six engines developing 7149 HP, which is approximately the normal full load with all engines in operation, and with each engine operating at 318 RPM turning the propeller shaft at 194 RPM, a ship speed of 17.4 knots was obtained.

At first glance it might appear that the ships have an unusually large electrical generating capacity. The two 600 KW units, however, have been installed for a very good reason. It is contemplated that at some future date the refrigerated cargo capacity of the vessels will be increased, and it is desired that this can be done without the installation of additional generating sets.

The ships were designed with machinery aft in order to obtain the best distribution of cargo space. Since they were to carry fresh fruits and vegetables, however, it was also necessary that they have very high speed, and of course a great deal of power. The somewhat unusual arrangement of four-cycle supercharged propelling machinery was adopted therefore because it permitted the greatest possible power to be fitted into the very fine afterbody of these ships.

These ships reflect a great deal of credit on the Tampa Shipbuilding Company, the Nordberg Manufacturing Company, and other American equipment manufacturers and it may be safely predicted that these ships, when they go into service, will be watched with great interest by shipping men everywhere.

The Best Thinking

The best thinking of the past has been done by slaves who wished to be free, by hungry who wished to be fed, by frustrated who wished to be recognized and by countless others in the legion of the unsatisfied. Contentment is rocky soil for growing thoughts.—Publius Stincus.

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New Devoe Folders Available

Through Wm. J. O'Callaghan, Manager, Marine Sales at Devoe and Raynolds Company, Inc., New York, we learn that their Devoe Yacht Finishes are again available for the first time since the beginning of the war. Devoe finishes include such items as Devoe Yacht White Gloss, a radical departure from the usual yacht white. It dries quickly, covers exceptionally well, and is unequalled for a whiteness that will not discolor. Devoe Antifouling finishes are efficient in their ability to maintain resistance throughout the season, eliminating mid-season scraping and painting. And Hong Kong Spar—a varnish that won't spot white or allow wood to weather black throughout the entire season.

Devoe has also issued a new folder on their finishes for the heavy marine line, including such finishes as the following: Outside whites, white enamels, aquaplast bottom paints, inside whites, marine varnishes, hull blacks, etc.

Either folder and color chart may be obtained through Pacific Marine Supply Co., Seattle; Oregon Marine Supply Co., Portland; Weeks-Howe-Emerson, San Francisco; and Atlas Marine Supply Co., San Pedro, or by writing to Marine Division, Devoe & Raynolds Co., Inc., 44th St. at First Avenue, New York City.

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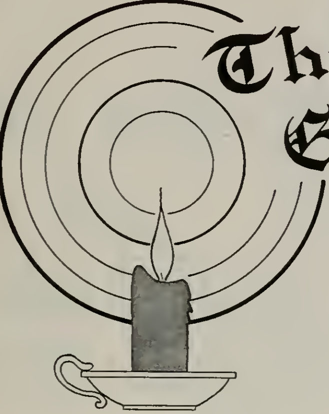
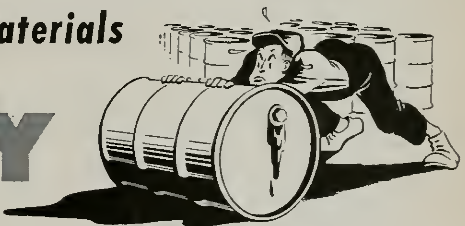
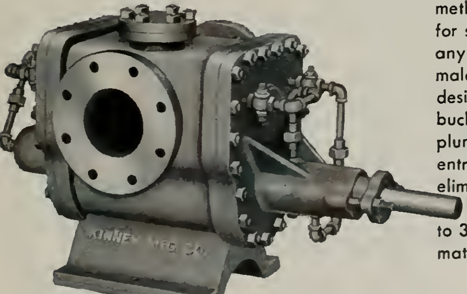
To make Ronaflex even more useful to industry, it is available with hi-speed, snap-on couplings that can be connected and disconnected in one easy operation—in one second. Ronaflex tubing assemblies are being produced by the Ronaflex Tubing Company, Inc., of Philadelphia, with distribution handled by the Penflex Sales Company, 7200 Powers Lane, Philadelphia.







KINNEY MFG. CO.

Report of The President's Advisory Committee on The Merchant Marine

(Continued from page 35)

Government policy, new private capital can be brought into this field of enterprise.

Plans are immediately available for two classes of moderately large passenger-carrying vessels which are urgently needed and for which private operating companies are prepared to enter into purchase contracts. The only obstacle to concluding such contracts so far as the Committee can learn is the question of net cost to the operator; i. e. the difference between shipbuilders' contract price and the sum of the construction-differential subsidy and the cost of national defense features.

There are complications in the added cost of American standards for safety of life at sea and for crew's accommodations. The pressing national security needs for ships and shipbuilding, lead the Committee to recommend, in view of these practical difficulties and factors, that during the next three years, at least, shipbuilding contracts be placed at the maximum construction differential subsidy of 50% permitted by the 1936 act and which was used under congressional approval during the recent war period.

(3) *Building Program.*—The Maritime Commission has prepared and submitted to the Committee a study of prospective requirements for passenger-carrying vessels on the various foreign-trade routes and in certain domestic services. In its meetings with the representatives of the industry, the Committee has found general substantiation of the need for the services proposed by the Maritime Commission. It has on the other hand, in many cases, found a more conservative opinion on the part of the operating companies as to the characteristics for vessels best suited to these services. In the furtherance of the policy of private ownership and private operation of the merchant marine, the Committee believes that, consistent with national security considerations, preference should be given to the opinions and desires of the operating companies as to the designs to be provided. The prospective owner's interests and requirements in new vessels should likewise be guarded in the contract, in development of the working plans, and in the inspection during actual construction and outfitting.

The schedule of ship construction is advocated not as a rigid requirement, but rather as what the Committee believes to be a realistic estimate of the first steps toward putting the merchant marine and shipbuilding industry on a sound continuing basis. It is necessary that these steps lead in subsequent years to the development of an annual replacement program of cargo, passenger-carrying and tanker tonnage. This would give some assurance that the Nation's merchant fleet is maintained at a level of effectiveness commensurate with security requirements and at a degree of efficiency that should help to minimize the economic handicaps imposed by our higher costs of operation.

The passenger capacity represented by this program in ships to be completed by 1953 is less than 40 per cent of the total passenger traffic which the Department of Commerce estimates will be traveling overseas by water in 1950. Its total approximate cost, based on the Maritime Commission's estimates at present price levels, would range between $500,000,000 and $600,000,000, or average about $150,000,000 a year. A considerable part of this initial outlay should be recovered through the sale of the ships to private operating companies.

PROGRAM FOR CONSTRUCTION OF PASSENGER-CARRYING VESSELS

	Number of Ships	Approximate Gross Tons Per Vessel	Approximate Passengers Per Vessel
For fiscal 1948: (because of limited funds)			
Route or Service:			
New York to Mediterranean	3	21,000	675
*Round the world	5	13,500	180
Total, 1948	8		
For fiscal 1949:			
New York to Channel ports	1	50,000	2,000
New York to east coast South America	2	18-20,000	600
Gulf Coast to east coast South America	1	12,000	230
East coast United States to South Africa	2	8,000	300
*Seattle to Alaska	2	6,000	300
*Pacific coastwise (Los Angeles to San Francisco)	2	18,000	350
Total, 1949	10		
For fiscal 1950:			
New York, Boston to London	4	10,000	160
New York to Baltic Ports	2	13,000	150
*West Coast to Pacific	2	18-20,000	600
New York to Puerto Rico	2	7,500	350
Atlantic coastwise	3	18,000	350
Total, 1950	13		
For fiscal 1951:			
New York to Channel Ports	1	50,000	2,000
New York to Hamburg, Bremen	1	24,000	1,000
New York to east coast South America	1	18-20,000	600
*West Coast to Orient	2	22,000	800
*Seattle to Alaska	2	6,000	300
*Pacific Islands	2	4,000	250
East coast to West Indies and Gulf	4	6,000	300
East coast to Caribbean	2	9,000	350
Total, 1951	15		
Grand Total, 1948-51	46		

(*For Pacific operations.)

The building of two express-type passenger-carrying ships for the New York to Channel-port service will help to restore the heavy war losses in trans-Atlantic express passenger tonnage and will provide a type of vessel particularly useful in time of emergency. The Committee also considers it important that the re-establishment of satisfactory service under the United States flag from the Pacific coast to Australia be expedited.

In addition to the passenger ships enumerated in the foregoing table, it appears to the committee that national security considerations require that this program be supplemented by the building of a number of prototype high-speed dry cargo and tanker vessels, the construction costs of which are not included in the approximate figures given above.

. . . .

(7) *Distribution of ship construction.*—It is implicit in a program that aims to encourage a vigorous shipbuilding industry that the relatively small volume of tonnage to be built in the near future not be concentrated in one or two yards. Not only prices bid but the current work load, the availability of facilities, geographical location, and other conditions will have to be taken into account in determining suitable distribution.

In prosecution of such a program, it is important that the competitive character of the industry, expressed in efficiency of the operations and the close control of costs, be preserved, and no guarantee of survival can be or should be extended to any yard.

The building program contemplated will include groups of ships of the same design. Provision for the distribution of such a group to several yards is contained in section 502 (f) of the Merchant Marine Act of 1936, without penalty to the shipping company purchasing the ships, since the excess cost of building ships separately is paid by the Government as a national-defense measure.

(8) *Progressive replacement of war-built tonnage.*—The fact that a very large percentage of the dry-cargo and tanker tonnage in the American Merchant Marine today consists of ships built during World War II and that these ships are, therefore, of substantially the same age, is a matter of concern in any long-range program for this country. These ships will depreciate as a block due to

obsolescence and deterioration. A similar situation obtained after World War I. In the late thirties, the American cargo fleet, built during and just after that war, was rapidly being displaced in the trade routes by more modern and more efficient foreign-built tonnage. Corrective measures to avoid a repetition of this situation must be planned now to assure that the merchant fleet shall continue to include a proper proportion of modern efficient vessels. This is important from the viewpoint both of the economics of competitive commercial operations and of national security.

(10) *Sea-air transportation.*—This Committee is not constituted nor equipped to make any findings with respect to the above representations and has made no independent study of the facts. On the basis of the testimony it has heard, however, the Committee recommends that a thorough study be made to determine (1) whether air-mail contract payments are or are not being used unfairly to depress rates below reasonably compensatory levels for the air lines carrying passengers in competition with steamship companies; and (2) whether the development of both air- and water-transportation services so essential to national defense would be furthered or retarded by permitting coordinated operations.

Development of Ship Forms

(Continued from page 53)

stern would be lost in the eddies caused by the full lines. If a ship had gone fast enough to create the resistance wave hollow abaft the bow the roughness of the sea would doubtless have rendered it unnoticeable.

In passing it may be noted that Benjamin Franklin is among the early towing tank experimenters, his field being the effect of shallow water on the speed of vessels, particularly canal boats. By towing a miniature canal boat in a small trough fitted with a movable board to vary the depth he found that between the deepest and shallowest the time difference for the model to move the length of the trough was "somewhat more than one-fifth." His towing mechanism was the simplest: "To give motion to the boat I fixed one end of a long silk thread to its bow, just even with the water's edge, the other end passed over a well-made brass pulley, of about an inch diameter, turning freely on a small axis; and a shilling was the weight."

Up to about 1800 it is hard to distinguish between merchant vessels and naval vessels except, of course, the many-decked ships of the line. Many merchant ships such as the British East Indiamen were as well-armed and were run with the same discipline as ships of the Royal Navy; others were taken into naval service in times of conflict. Until the introduction of iron strapping and knees the building of a long wooden ship was virtually impossible—the structure was too elastic. This elasticity of structure required that naval vessels have relatively full lines at the ends so that there would be displacement to support the armament carried there; with fine lines the ship would hog. As the naval vessels set the pattern so the large merchant vessels followed.

There were, however, many legal and extra-legal businesses that required small, fast-sailing vessels—pilot service, smuggling, privateering and slaving, to mention a few. Vessels for such services became an American specialty after the American Revolution, when unsettled world conditions required that American ships be speedy or face arrest, although as a type they were known as early as 1750. The majority of the early vessels were built in Maryland and Virginia and the type was referred to as "Virginia-built" or the "Virginia model"; later it was better known as the Baltimore Clipper and usually rigged as a topsail schooner or a variation thereof.

The development of large sharp-model ships did not follow that of the smaller craft. A few were built for enterprising owners but as fine lines limited cargo capacity they were few and far between. Certain brigs and ship-rigged sloops were built for the U. S. Navy before and during the War of 1812. The demand for speed in large ships developed slowly—at first around Baltimore where ship owners had contact with the clipper schooners. A second influence was the inauguration about 1816 of a regular line of packets across the North Atlantic.

The first of these packet vessels were sturdily built after the fashion of the frigates of the time. That they made some rather astounding passages in spite of their relatively small size—about 121 feet long over all with a breadth of 28 feet—can be attributed to the driving ability of their captains, many of whom learned their trade in privateers, rather than to any superior hull form. To aid in speed subsequent ships had the ends fined slightly.

The greatest influence on packet ship design was the cotton trade out of New Orleans. In order to carry the greatest cargo on a given length with the restricted draft imposed by the bar at the mouth of the Mississippi a special type of ship having a long flat floor was developed. Ship builders had always considered that a flat floor was detrimental to speed, that for fast ships the midsection should be V-shaped of as small an area as possible. Under the command of capable seamen it was soon apparent that some of the cotton carriers were quite fast.

(To be continued)

Two Barges Raise One Barge

Smith-Rice Derrick Barges Nos. 3 and 4, raising a third derrick barge which recently sank in Islais Creek. The sunken derrick barge is owned by a local construction company. The lift was 178 tons.

Emergency Hints:

Valve Stem Gland Leaking

If an objectionable amount of steam leaks past the valve stem gland it may be due to a restricted lead-off pipe, which should be of ample size and open to the atmosphere. If the leakage is increasing it will be due to wear of the stem or its bushing. Find out which is worn and replace it. If a new bushing is installed always run a standard reamer through it after pressing it in place.

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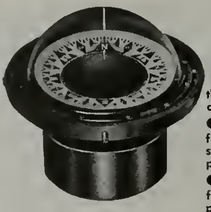

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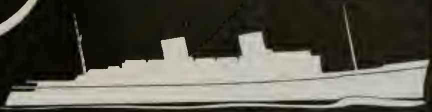

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George Fryette and "Rust-Oleum"

Here we have popular George Fryette, well known in Southern California marine circles, head of Barnes-Delaney Marine Division, with headquarters at Long Beach. George is telling the marine field all about the advantages of using Rust-Oleum for rust preventative on all exposed metal surfaces inboard and outboard.

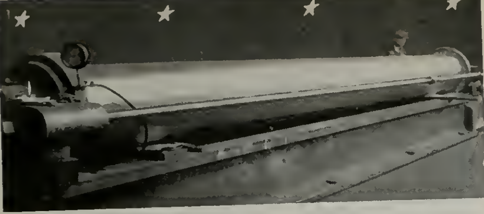
George points out that Rust-Oleum is available in aluminum and colors as well as in primer form. Mr. Fryette has had wide experience in the Los Angeles Harbor area, with ship painting and repair work.

Parkin is Port Engineer for Westinghouse

Richard N. Parkin has recently been named port engineer at San Francisco for the Westinghouse Electric Corporation. Prior to his new appointment, he had been serving as planning supervisor at the company's Sunnyvale, Calif., plant, where under previous ownership from 1925 to 1947 he had been manager of the service department. As port engineer, Parkin succeeds W. N. Hornberger, who has been transferred to the engineering department of the Westinghouse plant at So. Philadelphia, Pa.

Parkin is a resident of Palo Alto. He brings to his new assignment wide acquaintance and broad experience in the marine industry.

Richard N. Parkin, Port Engineer at San Francisco for Westinghouse.



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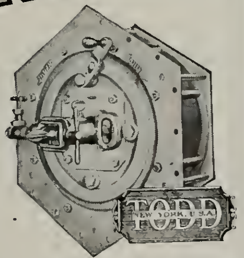

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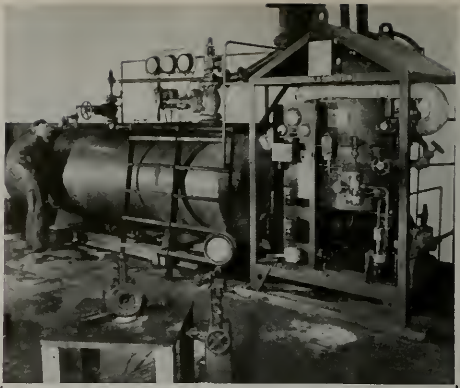

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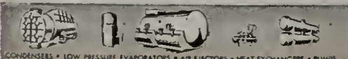

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GOLDEN STATE CONTINUES UNDER AMERICAN FLAG

◄

The former California Maritime Academy Training Ship, Golden State, coming off drydock at Bethlehem Steel Company's Alameda Repair Yard, where she is being outfitted for tramp service under the American flag.

John E. Tsavaris, President of the Panormetis SS Company, who recently purchased the vessel, expects to put her in operation late this month. Mr. Tsavaris, who has been just released as Commander in the Navy, is a former Repair Superintendent at the Boston Naval Shipyard.

EMMET McCORMACK VISITS WEST

K. C. Tripp, Pacific Coast Manager; Emmet McCormack, Vice President; H. K. Grady, Western Freight Traffic Manager—Moore-McCormack Lines.

In San Francisco on November 25, Emmet McCormack announced that a fleet of five specially designed C-3 freighters will take over servicing the Moore-McCormack Lines' Pacific Republics Line route between the West Coast and the east coast of South America between December and mid-1948.

◄

Commodore R. C. Lee and Mrs. Lee aboard the Gripsholm prior to sailing for Scandinavia. Commodore Lee is Executive Vice President of Moore-McCormack Lines.